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JULIEN GARFIELD MANSER (A.B., 1926, Southwestern College; D.D.S., 1930, St. Louis University School of Dentistry) collaborated with Howard R. Raper in the preparation of the material and the article on the use of sulfanilamide in dentistry as well as on THE REMOVAL OF BROWN STAIN FROM FLUORINE MOTTLED TEETH appearing in this issue. Doctor Manser is a general practitioner who was formerly a member of the U. S. Public Health Service, including one year's service in Alaska, aboard the Coast Guard Cutter, Northland, about which he wrote in the May, 1938, issue of ORAL HYGIENE.

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Removal of Brown Stain from Fluorine Mottled Teeth*

HOWARD R. RAPER, D.D.S. and J. G. MANSER, D.D.S., Albuquerque, New Mexico

DIGEST

1. Fluorine stain need no longer be considered "incurable."

2. There are virtually no cases of staining that cannot be cured or greatly improved either with acid or by grinding off the outer layers of enamel.

3. The time required is usually less than an hour, not counting the time necessary for subsequent polishing.

4. The several "secret formulas" for removal of fluorine brown stain which have been exploited for several years, in all probability, are either hydrochloric acid or some other mineral acid.

5. Hydrochloric acid or any enamel solvent is too dangerous an agent to be used on enamel by lay persons. Only dentists should be permitted to use the acid for the removal of fluorine brown stain. Dentists must use the acid with judgment and care, to prevent injury to the teeth.

6. Fluorine stain may be removed with safety by either the acid or the grinding technique described.

7. Dissolving or grinding off the superficial surface of the enamel does not harm the tooth either functionally or in appearance.

8. Fluorine stain is more superficial than has been supposed and its correction hinges on this fact.

9. Acid or grinding should be tried before resorting to jacket crowns.

10. Fluorine stained teeth sometimes constitute a disfigurement almost equal to harelip or cross-eyes.

11. Removal of the stain may and often does have a tremendously favorable psychologic effect on the patient.

12. Knowledge that fluorine stain is curable will be accepted as good news by thousands of victims scattered throughout the United States.

13. The greatest anxiety of the authors in announcing a remedy for fluorine mottled teeth arises from the fear that it might hamper the work of those still engaged in charting fluorine areas and correcting contaminated water supplies.

14. The authors warn that they know no more about this method than can be learned in one month of intensive effort.

15. CAUTION: Do not make definite promises of cure. How completely the stain can be removed depends on how deeply it has penetrated. Inasmuch as there is no way of determining this beforehand, there is no way of predicting just how much any case may be benefited.

Do not *persuade* any patient to have the fluorine stain removed. Do it only for those who ask to have it done and who are willing to take the risk of any possible unanticipated harm. This rule should apply until several years have passed in observation of patients treated.

EVERY DENTIST IN the United States has seen fluorine mottled teeth—unsightly teeth, splotched with brown and white. Almost every dentist has on occasion advised victims of this disfigurement that nothing can be done for them, except perhaps to make jacket crowns. The purpose of this article is to show that it is not true that nothing can be done for these sufferers except to resort to the making of jacket crowns. We use the word "sufferers" deliberately. People having the disfigurement, especially

*Read before the New Mexico State Dental Society, July 1, 1941.

Fig. 1

Fig. 2

Figs. 1, 2, 3 and 4—Before and after pictures of one of the most successful cases.

young women, are profoundly humiliated by it. At its worst, it is comparable to cross-eyes or harelip. Victims of the stain develop characteristic mannerisms in their efforts to conceal the teeth. Their smile is distorted, unnatural. They try to avoid lifting the upper lip. Some even seem a little sullen, or indifferent, or abnormally on the defensive. A casual study of the psychologic effect of correcting the disfigurement has been gratifying. Many patients are almost tearfully appreciative. "For the first time in my life," they say, "I can look right at people and smile."

There is something discouraging about the appearance of fluorine brown stain to the dentist called on to treat it. It has the appearance of something that cannot be removed. It is seen as an integral part of the enamel. This hopeless appearance, coupled with our knowledge that these teeth erupt into the mouth already stained, with the stain built into the tooth, had in the past led us to conclude, without sufficient investigation, that the stain penetrated throughout the entire thickness of the enamel. Perhaps this is why dental literature reveals so little research aimed at the discovery of a method for removing fluorine stain.

Previously Advanced Techniques for Removal of Fluorine Brown Stain

Bleaching Methods—Doctors J. Wilson Ames and Harold B. Younger have published articles describing substantially the same technique for bleaching fluorine brown stain. Briefly stated, it is a method of applying a mixture of ether and hydrogen dioxide with heat. The rubber dam should be applied, preferably extending over the eyes of the patient for protection against accidental explosion of the inflammable ether. Both Doctors Ames and Younger have evidently succeeded in obtaining gratifying results, but their technique is laborious and somewhat hazardous unless applied carefully, and, we are told by several who have tried it, rather uncertain as to results. As many as twenty or more treatments may be required, and even then, satisfactory results may not be attained. Although the method was introduced several years ago, it has never gained wide popularity.

In addition to the ether-hydrogen dioxide treatment, we learn upon investigation that there are several men throughout the country who have or claim to have secret formulas for the bleaching of or removal of fluorine brown stain. Some of these gentlemen, we understand, offer courses of instruction to their fellow dentists for a substantial fee. Whether the fee for instructions includes revealment of the nature of the secret bleaching (or de-staining) solution, we cannot say. We do say, however, that we feel reasonably certain that we know the essential nature and contents of most, if not all of these se-

Fig. 3

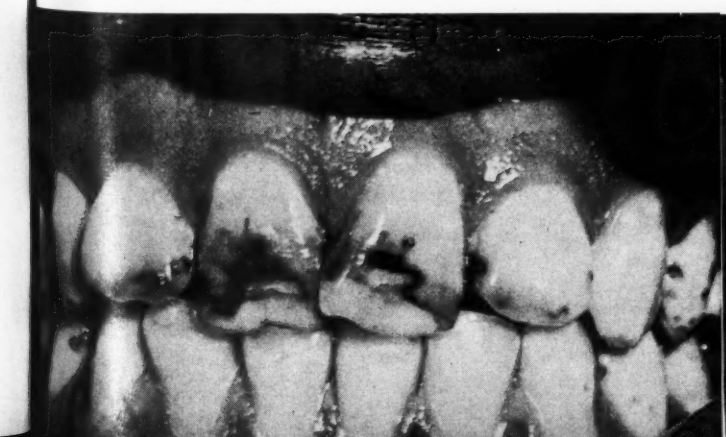

Fig. 4

cret formulas for the removal of brown stain from fluorine mottled teeth.

The treatment we shall describe presently, we believe, reveals the secret methods and formulas, word of which has been reaching the profession by devious ways for several years. As might be expected, the treatment is embarrassingly simple; but it is so important to those in need of it that they have paid quacks and promoters of secret formulas substantial fees to have it applied. As for its effectiveness, we need say only that many of those who have received the treatment are perfectly satisfied and would gladly pay several times the amount of the original fee rather than return to the original condition of their teeth.

Grinding Method—At least one man knew from clinical experience that it was possible to grind off the stain with stones and discs, but he withheld this knowledge for special reasons of his own which he later explained. He knew also that there were other men who claimed knowledge of a secret formula which was said to remove the stain, and he felt reasonably certain that he knew the essential nature of the secret agent. He assumed that the formula "must be mineral acid, probably hydrochloric." But he said nothing about this either; nor did he put the acid theory to a clinical test. The name of the man of whom I speak is known to everyone who knows anything about fluorine mottled teeth. It is Frederick S. McKay, who, along with G. V. Black, published the first papers on the subject in the *Dental Cosmos,* from May to August, 1916.

Why did Doctor McKay withhold his knowledge of the grinding cure and his suspicion of the nature of the secret formulas? His work and interest centered in the discovery of the cause of mottled teeth, followed by a campaign to correct the fluorine-contaminated water supply that caused the disfigurement. He was, he tells us, interested in preventing the disfigurement for future generations. Had he announced a cure at the same time that he publicized his discovery of the cause, it would have mitigated against his efforts to get at the root of the trouble by correcting water supplies.

"Why correct the water supply if

Fig. 5

Fig. 6

Figs. 5 and 6—Results in this case were classified as "fair to good." Complications were caries, silicate restorations, and some eroded areas.

there is a cure for the damage it does?" That would have been the attitude of the city fathers, and nothing would have been done to supply fluorine-free water. Doctor McKay kept silent about the cure while the work of finding the fluorine districts continued. The United States Public Health Service, the American Dental Association and many other health agencies joined in the work. Three hundred and seventy-five known areas, divided among twenty-six states, have now been charted. And the idea that fluorine should be kept out of the drinking water is now firmly established. Doctor McKay finally published an account of his grinding technique in 1936 in Black's revised OPERATIVE DENTISTRY, but for some reason, it has failed to win the serious attention of the profession.

Effective Demonstration of "Secret Formula"

Our interest in fluorine stained teeth is of recent origin. Let us tell you how it came about and so lead you into the subject as we ourselves were led into it.

On May 21 it came to the attention of one of us, by virtue of his position on the New Mexico State Board of Dental Examiners, that a certain Mrs. M., said to be a nurse from Texas, was located at the El Fidel Hotel in Albuquerque, and that the purpose of Mrs. M.'s visit to the city and state was to remove the brown stain of fluorine mottled teeth for a fee of twenty-five dollars per case. Mrs. M. either did not know that she might be violating the law of the state, or did not care. It is customary in such cases to make the necessary investigation to verify the complaint, to obtain needed evidence, and then to warn the law violator to desist, before taking legal action. It was in pursuance of this course that I (Raper) finally met Mrs. M. and watched her at work.

The operative procedure was simple. Mrs. M. dipped cotton, wrapped on an orangewood stick into a yellowish, sour-smelling solution and rubbed it on the stained teeth. Then she had the patient rinse the mouth with a second solution, also secret in nature. This process was repeated many times. I had expected the effect to be so slight that there would be some argument as to whether or not anything had been accomplished. I had expected to have to say, "No, I can't see any difference yet." And I expected to have to listen to such conditioning phrases as, "Can't you see that? Surely you can see the difference. Look at it in this light. I'm sure the patient can see the difference. Here, Miss, look in the mirror—*You* see the difference, don't you?"

Well, it was not like that at all. Anyone could see the difference almost at once. The magic, mysterious fluid worked! It was making the teeth white! The effect was as spectacular and unmistakable as the effect of soap and water on a small boy's face. This woman had what she said she had: something that removed the brown stain from fluorine mottled teeth. What that something was, she would not tell. She made it clear that she did not intend to tell anybody. She would take the stain off anyone's teeth who wished it removed —for twenty-five dollars. Other than that, she had nothing to say and nothing to sell. It required less than half an hour to apply the treatment; thus the lady was asking for, and getting more than fifty dollars per hour for her services.

She told us that the solution was one of her own invention and that she had applied for a patent. We were led to believe that we might be able to get some of this patented solution in due time, but that for the present, the only way to get fluorine brown stain off teeth was to send the patients to her.

Mrs. M. told us how she happened to make her discovery. She had a daughter, she said, with fluorine mottled teeth. She had appealed to "one hundred dentists" to correct the disfigurement. They told her that nothing could be done. Now if Mrs. M. had a daughter, and if she had fluorine mottled teeth, and if she did apply to numerous dentists to correct the disfigurement, it is not difficult to believe that she was told nothing could be done. And that, my colleagues, is something to be held in mind.

"Well," said Mrs. M., "you know there is nothing a mother will not do for her child. I set about finding something that would take off that stain for my little girl. I am a nurse,[1] you know." Mrs. M. paused after this bit of autobiography to let it take full effect. She seemed to think it explained a lot of things.

"I am a nurse," she repeated, "and finally I perfected this solution which I used to whiten my little girl's teeth and which I am using here today."

One of us (Raper) has reason to be suspicious that if Mrs. M. had a daughter, and if this daughter had mottled teeth, and if mama did look for a solution to the defect, and if the correction was successfully attempted, it was accomplished by the heroic experiment of using bathtub cleaning fluid on the teeth. Such cleaning fluids often contain muriatic acid, and this fits neatly into the picture.

This theory is further substantiated by the activity of a Mrs. S., a housewife, living in Douglas, Arizona, who removed fluorine stain from her children's teeth with a mixture of honey, vanilla and muriatic acid. We have seen one of the children whose teeth were said to have been treated in this way ten years ago. The treated teeth were healthy and entirely free from stain.

[1]It has subsequently been learned that Mrs. M. is not a graduate nurse but used to have a Turkish bathhouse.

Fig. 7

Fig. 8

Figs. 7 and 8—This is the least satisfactory of fifteen cases; the patient, however, considered the treatment successful. Results, as they appeared in the mouth, were better than shown here. Yellow photographs dark, and the enamel had a yellowish cast after treatment. (See legend to Fig. 12.) Doctor George G. Ingham of Armarillo, Texas, warns us that in his opinion numerous cases such as this one are likely to be encountered.

Mrs. M. spoke about not being able to get anybody to help her, although she did not make it clear just what help she wanted. Then she grew eloquently emotional, declaring that she "would devote the balance of her life to rescuing children from blighted lives caused by mottled enamel." Her attention was called to the fact that if she was so anxious to save the children, the best way to do this was to reveal the identity of her "secret formula." This did not seem to appeal to her. She seemed to have a distinct preference for devoting the balance of her life to saving children for fifty or seventy-five dollars per hour.

So far as any information vouchsafed by Mrs. M. is concerned, we are in total ignorance of the nature of her particular secret formula; however, we believe we know the agents she used, and if we do, it is reasonably safe to assume that these agents comprise the essential nature of the other "secret formulas" used by other persons, many of them members of the profession, for the same purpose.

Formula

The active solution is hydrochloric acid. The second, or rinsing solution, is an aqueous solution of sodium bicarbonate. If this is true (and the accompanying illustrations offer convincing evidence to sustain the theory) the face of dentistry has every reason for turning a bright red, for these two agents are to be found in nearly every dental office in the country; yet their usefulness in cases of fluorine mottled enamel is virtually unknown.

We need not describe in detail how we finally came to the conclusion that Mrs. M.'s solution was hydrochloric acid. It was a rather simple matter of deduction based on observation, an elemental chemical test or two, and a few experiments on extracted teeth. We felt reasonably certain of our ground before we decided to try a 12 per cent solution of the acid in a practical case. It proved to be hardly strong enough, and the percentage was increased to 18. This yielded results comparable if not identical with those attained by Mrs. M.

Hydrochloric acid is in no sense a bleaching agent. The treatment is in no sense a bleaching method. It is simply a method of removing a sufficient amount of enamel to eliminate the stain. The same result can be had with stones and discs or other enamel solvents. The use of the acid may be accurately described as a chemical method of accomplishing a mechanical task. The surprise to us has been that so little enamel need be removed. The stain is more superficial than we had anticipated.

Clinical Experience

So far as we know, this is the first comprehensive report on the acid method of removing fluorine stain to be offered to any dental society or periodical, and we are keenly aware that the report is based on limited experience. The news, however, is of the utmost importance to thousands of people with fluorine stained teeth, and to all dentists having such people as patients. We believe that it is never too early to express an honest opinion, coupled with a full and frank explana-

tion of the evidence on which that opinion is based. We give warning that we know no more about the subject than can be learned in one month.

We have treated fifteen cases, which comprised all four degrees of staining, from the first degree wherein the staining is slight to and including the fourth degree wherein the disfigurement is most pronounced. All patients have been benefited.

We warn against making definite promises to patients beforehand. How completely the stain can be removed depends on how deeply it has penetrated, and inasmuch as there is no way of judging this, there is no way of predicting results.

We have met with no accidents and observed no results that might cause us to consider abandoning the treatment. Exactly what consequences of treatment the future may reveal, we do not know, but nothing has occurred up to date to cause us any special anxiety.

Most patients have been extremely enthusiastic and grateful for the service. None has complained.

The time required to accomplish destaining varies according to the difficulty of the case; but is usually less than one hour and sometimes as little as fifteen minutes. This does not include the time later required for polishing.

Our experience thus far leads us to believe that, other things being equal, it may be easier to remove the stain for young patients than for older ones.

It has not been our practice to try to remove all the white mottling. Its appearance is not as objectionable as the brown stain and it frequently seems to be too deep in the enamel to be removed with safety. We have treated only one case of white mottling in which there was no brown staining. The appearance of the teeth in this case was considerably improved.

We have treated no case in which the enamel already showed marked signs of disintegration, as it sometimes does in mottled teeth, and we would hesitate to do so without a full explanation to the patient of the special risk and uncertainty.

Inasmuch as the purpose of de-staining is solely an esthetic one, we have confined our efforts mainly to the six upper anterior teeth.

Fig. 9

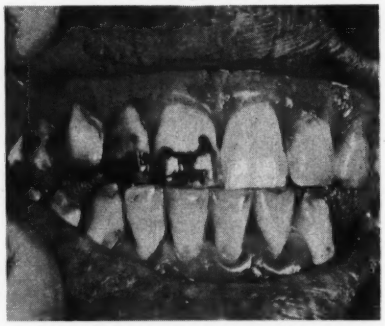

Fig. 10

Fig. 11

Figs. 9, 10 and 11—Extensive staining and striking results. Do not mistake the highlights on the teeth, in these and other pictures, for decalcification as a result of the use of the acid. Please note the numerous highlights on the gums as well.

Technique

We recommend that the mouth be placed in a healthy condition before using the acid treatment, and especially that any existing gingivitis be first treated and cured.

Our experience is too limited for us to offer a time-tested and minutely exact technique; however, it is not a complicated method, and if we supply the essentials, we feel that any competent dentist will be able to work out the details for himself.

Armamentarium — The following materials are employed: (1) hydrochloric acid, 18 per cent; (2) saturated aqueous solution of sodium bicarbonate; (3) a small medicine dish; (4) orangewood sticks; (5) cotton; (6) a water syringe. (Subsequent to the destaining process the usual polishing paraphernalia must be brought into use.)

Strength of Acid—Ordinary "commercial" hydrochloric acid may be obtained in any drugstore. Dilution with an equal amount of water makes a 50 per cent solution of the commercial acid; however, inasmuch as the commercial acid itself is only a 36 per cent solution, the actual concentration of acid, when mixed with water and ready for use, is only 18 per cent. We have used the acid in several different strengths and have, for the present at least, settled on the 18 per cent solution, which we repeat is made by mixing the commercial acid with an equal amount of water. Weaker solutions do not seem adequate in some cases, and stronger ones are not necessary.

Procedure—1. The end of the orangewood stick may be shaped to suit the operator's preference. A neat, tightly-wrapped swab of cotton is wrapped on the end of the stick. An 18 per cent solution of hydrochloric acid is placed in the medicine dish and put on the dental bracket. The cotton swab is dipped in the acid, then rubbed on the stained teeth from 1 to 2 minutes.

2. A water syringe is used, immediately following the acid application, to flood the field with the neutralizing sodium bicarbonate solution, and the patient is allowed to rinse the mouth with more of the same solution.

3. This complete process is now repeated as often as necessary to gain the desired results; or, until the operator concludes that no more enamel should be removed.

4. Our first thought was to complete the de-staining process at one sitting, but our present method is to prolong the treatment for only about thirty minutes or less; then stop and continue it at another sitting if results are not yet satisfactory and it appears safe to remove more enamel. *A good rule to follow to prevent taking off too much enamel is to limit the time of applying the acid to ten minutes or less, for any one tooth at any one sitting.* If upon

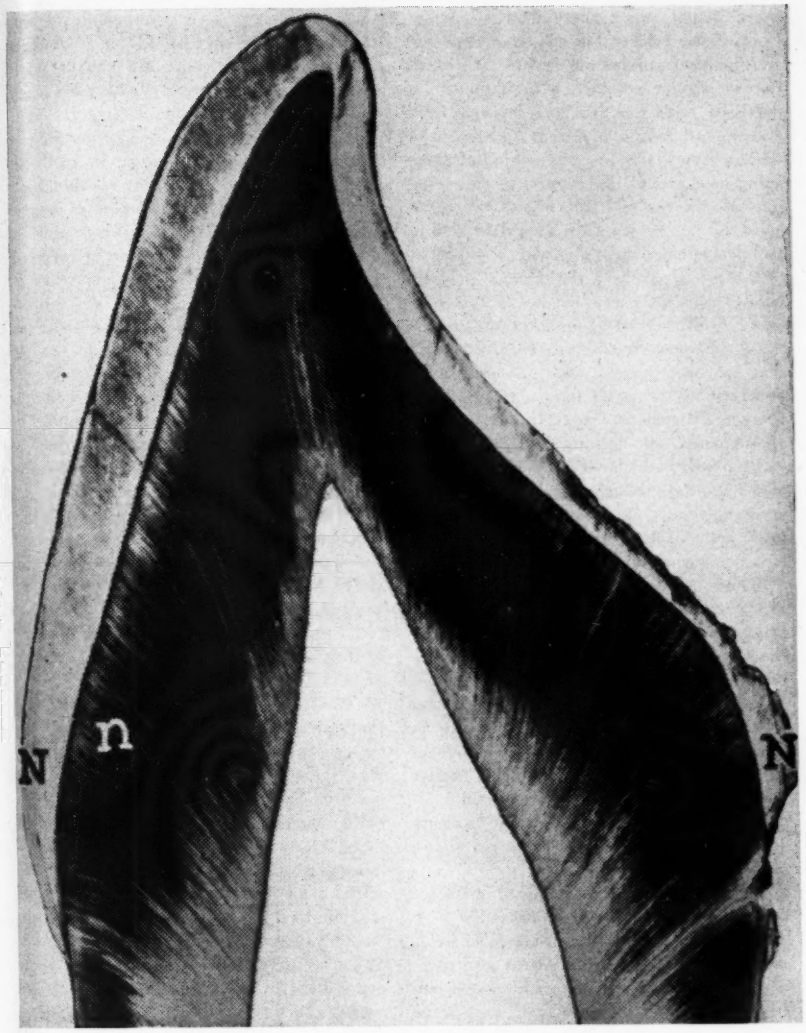

Fig. 12—(From Dental Science and Dental Art, Edited by Samuel M. Gordon, Ph. D., Philadelphia, Lea & Febiger, 1938, page 70, Fig. 37. Photomicrograph prepared by Doctor D. D. Jackson.) The purpose of this illustration is to refresh the operator's mind as to the thickness of enamel. Since this article was written, we have succeeded in procuring five extracted teeth affected with fluorine brown stain. Upon sectioning, the stain was again found to be superficial. We found it usually not much thicker than the black line seen on the periphery of the enamel in this illustration, i. e., only about one tenth of the thickness of the enamel. We had enlarged photographs of these sections made, but the stain seemed to penetrate deeper in the photographs than was apparent to the eye when the specimens themselves were observed. The enamel under the stain was tinged with yellow, and this was picked up by the photographic plate. The yellowish cast of the enamel, referred to in the legend to Fig. 8, evidently was due to pigmentation of the enamel itself, and not to the transmitted color of the underlying dentin.

returning for another sitting, the patient reports even a threat of hypersensitivity to hot and cold foods, the treatment may be stopped in plenty of time to forestall any serious consequences.

5. The greatest amount of rubbing will have to be done on the areas of deepest stain. Inasmuch as it is possible to remove all enamel, or weaken the incisal edge of the tooth, by a too-insistent use of the acid, the operator must have sufficient judgment to stop and leave some of the stain rather than cause serious injury to the tooth. One should be especially careful in the cervical region where the enamel is thinnest. Fortunately, the deepest stain is usually in the thickest part of the enamel.

Probably the most important requirement in the application of either the acid or grinding technique is to have the judgment to know when to STOP.

6. We believe the acid should be used throughout the entire labial surface of the tooth, partly to remove the enamel luster uniformly and also to remove some, but not necessarily all, the white chalky areas. Doctor McKay advises the application of this same principle for his grinding technique; that is to say, he takes some enamel off the entire surface, going deeper in the areas of deepest stain, but does not make a deliberate effort to remove all opaque white areas.

7. After de-staining is completed, or carried as far as the operator considers justifiable, the patient is seen at subsequent sittings when the enamel is polished with suitable polishing discs, strips, and fine polishing pastes.

Silicate cement restorations are soluble in hydrochloric acid and may have to be replaced after subjection to its action.

Choice of Methods

Whether the stain is removed by chemical or mechanical means seems to us a matter of secondary importance. The important thing is that this stain is more superficial than has been surmised and may be removed either with an acid or by grinding.

Inasmuch as there are two ways of removing the stain, both of which are effective, it seems unlikely that dentists will ever agree as to which is the better method. We anticipate that some will prefer the acid method, whereas others will join Doctor McKay in his preference for the mechanical method, and that this division of opinion will remain permanent.

Advantages of the Acid Method—1. There is less discomfort to the patient, because there is no grinding.

2. There is more uniform effect throughout the surface of the tooth and less likelihood of leaving a needlessly uneven surface.

3. The procedure is less laborious for the operator.

4. The procedure is less fright-producing to the patient, who may become uneasy about prolonged grinding.

Advantages of the Grinding Method—The exactitude and positive control of mechanical procedure, when skillfully executed is an advantage of the grinding method. The grinding method would have a tendency to keep the treatment for stained teeth exclusively in the hands of dentists—where it belongs.

Perhaps neither method is so superior to the other that it should be used exclusively. An open-minded willingness to use either technique, depending on the case and circumstances, seems best calculated to yield the most satisfactory results.

Consideration of Objections to the Use of Hydrochloric Acid

The following is an attempt to enumerate and consider all objections, real and conjectured, to the use of hydrochloric acid for the removal of fluorine brown stain:

1. Fear of using so destructive an agent as hydrochloric acid on enamel.
2. Fear of etching the enamel.
3. Fear that the enamel may be left in such a state as to accumulate food and tobacco stains, or have a gray, dull, displeasing appearance.
4. Fear of removing so much of the enamel that the teeth may be left hypersensitive to hot and cold and fruit acids.
5. Fear that the hydrochloric acid may injure the gums and other soft parts of the mouth.
6. Fear that there may be a recurrence of the fluorine stain.
7. Fear that the pulp of the tooth may die subsequent to the treatment and as a result of it.
8. Fear that there may be a delayed or continued action of the acid following the treatment.
9. Fear that the action of the acid may have an unseen destructive effect on the enamel which will manifest itself later in some unanticipated and disastrous manner.
10. Fear that the enamel may break off the crown some months or years following treatment.
11. Fear that the teeth may become more susceptible to caries.

1. *Fear of Using a Highly Destructive Agent on Enamel*—To be sure hydrochloric acid is not a proper agent to be used carelessly on teeth. It is no more destructive, however, than burs and stones. The use of the latter is limited by law to the hands of dentists. The use of acid should likewise be limited to trained dental hands. In this regard, we see danger ahead. Certainly we do not want to see the use of this powerful acid fall into untrained hands. It would be serious if it should be offered to beauty operators and perhaps the public under some trade name. It is hoped that our pure food and drug laws will prevent this calamity.

We should admit freely that the use of hydrochloric acid on teeth is dangerous, and we should emphasize the fact to the public. But we should not be too timid to use it ourselves with the usual professional care and skill necessary to prevent disaster. With thorough understanding of the kind of agent being used and of the purpose to be accomplished, the use of hydrochloric acid to remove fluorine brown stain should be safe in any competent dentist's hands.

2. *Fear of Etching the Enamel*—Hydrochloric acid does etch enamel, but the appearance of the surface it leaves is no worse than the appearance of an enamel surface that has been ground with a coarse stone, and certainly no worse than a great deal of the porcelain dentists use. We estimate that approximately two thirds of the luster of the enamel may be restored by polishing. After polishing, the etching is not detectable by ordinary, casual observation. Patients are usually unable to see the etching even when it is pointed out to them.

3. *Fear that Enamel Will Accumulate Food and Tobacco Stains or Have a Displeasing Appearance*—An etched surface undoubtedly accumulates food and tobacco stains more readily than a highly polished one. All enamel surfaces that have had acid used on them should be polished subsequently. If this is done, it is not difficult to keep the teeth clean. Even if it should be necessary for the dentist to clean the teeth more often for a while, almost no patient would object to this as a part of the price to be paid for being rid of the disfigurement of the stain.

We have observed no "dull, gray, displeasing appearance" following treatment.

4. *Fear of Hypersensitivity to Hot and Cold, and Fruit Acids*—There has been no hypersensitivity following treatment in any of our cases thus far. Fortunately, the most stain usually occurs in the incisal half of the crown where the enamel is thickest. We recommend that the operator refresh his memory as to the thickness of enamel by dissecting a few teeth, and then make it a point not to take off too much.

5. *Fear of Injury to Gums and Other Soft Tissue*—The use of 18 per cent hydrochloric acid according to the technique described has resulted in little escharotic action. Slight burning and desquamation of the gums at the gum line will probably occur, but not enough to cause the patient any special annoyance or to do the tissues any permanent harm. The mucous membrane of the lips and cheeks will not be affected if the proper technique is followed.

Two rules in technique should be observed to prevent unnecessary escharotic action: First, continue the use of the acid no longer than two minutes at a time before applying the neutralizing solution. Second, continue the treatment no longer than about thirty minutes at any one sitting. We have not found the use of the rubber dam necessary.

6. *Fear of Recurrence of Fluorine Stain*—We believe this fear to be an unjustifiable one. We have seen moderately reliable documentary evidence of cases treated as long as seven years ago without any recurrence of staining. Inasmuch as the stain is removed, not bleached, there seems no chance of its return.

7. *Fear of Pulp Devitalization*—If almost all the enamel should be removed, leaving the tooth sensitive to thermal shocks, undoubtedly the pulp might be affected; however, if the operator will exercise the care he should, he will not remove an excessive amount of enamel. One way to guard against excessive removal is not to take off a great deal at any one sitting. Thus, if a threat of sensitivity develops, treatment may be stopped in time.

8. *Fear of Delayed or Continued Action of Acid Following Treatment*—There is no scientific basis for such speculation.

9. *Fear of Unanticipated, Disastrous Action of Acid on Enamel*—This fear, too, is mainly an unwarranted anxiety. There is, so far as we know, no good reason for supposing that the action of the acid extends beyond the enamel it removes; hence, after a few polishings, there should be no enamel left which has been acted upon at all.

The anxiety in this connection seems to be based on the assumption that perhaps the interprismatic cementing substance is dissolved out of the enamel, leaving the enamel rods unsupported. If this does occur there is certainly danger that the enamel may crumble. So far, we have observed no clinical evidence that it does. Any answer to the question, based on laboratory experiment, would be inconclusive. Only clinical observation over several years can provide this information.

10. *Fear of Subsequent Breaking off of Enamel from the Crown*—Even if all the enamel should crumble off the crown—an eventuality we do not expect—the condition could be corrected with a jacket crown. We have consistently warned patients of this remote possibility and they, with equal consistency, have been willing to take the chance.

11. *Fear of Increased Susceptibility to Caries*—If too much enamel is removed in the cervical region, it might easily make teeth more susceptible to caries in this location. The deepest staining, however, usually occurs in the incisal half of the tooth, so that there is not often any reason for excessive use of the acid near the gum line.

1516 *East Silver Avenue.*
220 *First National Bank Building.*

Treatment of Defects from Congenital Absence of Upper Lateral Incisors

ROWE SMITH, D.D.S. and WALTER WYRICK, D.D.S., Texarkana, Arkansas-Texas

DIGEST

This is a presentation of a simple, easy, and inexpensive method for correction of the defects resulting from the congenital absence of upper lateral incisors. The technique is illustrated by a practical case.

A YOUNG WOMAN, aged 20, presented with an excellent dentition except for congenitally missing right and left lateral incisors. Clinical and roentgenographic examinations revealed that the supporting structures were normal except for the existence of dense fibrous gingival tissue between the right and left central incisors. A careful medical examination indicated good general health with no systemic disturbances whatever. The disfigurement shown in Figs. 1 and 2 was due to the congenital absence of the upper lateral incisors.

For several years this patient has been thoroughly cognizant of this abnormal dental condition. By a constant effort to conceal the defect during conversation, she had developed a retiring complex. She stated that she greatly dreaded being seen by people because she felt that everyone noticed that the teeth were absent.

The patient reported that she had consulted eight dentists in several cities over a period of years in regard to correction or improvement of this dental abnormality but had not received any acceptable advice. Most of the advice received was that any dental treatment would make the condition worse. Some suggested orthodontic treatment which would require more time and expense than the patient felt she could undertake. One advised removal of the central incisors and the insertion of a removable prosthetic appliance to restore the four incisors.

As can be noted, the three chief problems of the case are: (1) movement of the central incisors into proper position; (2) lack of length of the right and left cuspids on the lingual, mesial, and distal for adequate retention of abutments for fixed bridges; and (3) selection of the best and least complicated method to supply the missing right and left lateral incisors.

Plan of Treatment

After a study of the roentgenograms, models, and photographs the following simple treatment was planned:

1. Resection of the dense fibrous tissue between the central incisors, making it possible for the right and left central incisors to be moved and maintained into near normal position.

2. The dense gingival tissue on the lingual, mesial, and distal of the abnormally short right and left cuspids to be removed by gingivectomy to give sufficient length to the short cuspids.

3. The missing lateral incisors to be supplied by fixed bridges.

Technique

Infiltration novocain anesthesia was employed to prevent pain.

1. The dense fibrous gingival tissue between the central incisors was resected by making a half moon cut on the labial and lingual about 2 mm. above the gingival margin; thus it was possible to peel out this tissue easily. Orban right-angle periodontal knives were employed to make the cuts and an ordinary spoon from the Black cutting set was used to peel out the tissue.

2. The same two knives were used to resect the gingival tissue on the mesial, lingual, and distal of the cuspids. The

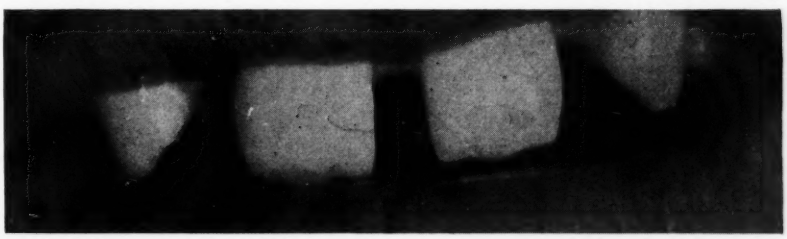

Fig. 1—Appearance when patient presented. Note congenitally missing lateral incisors.

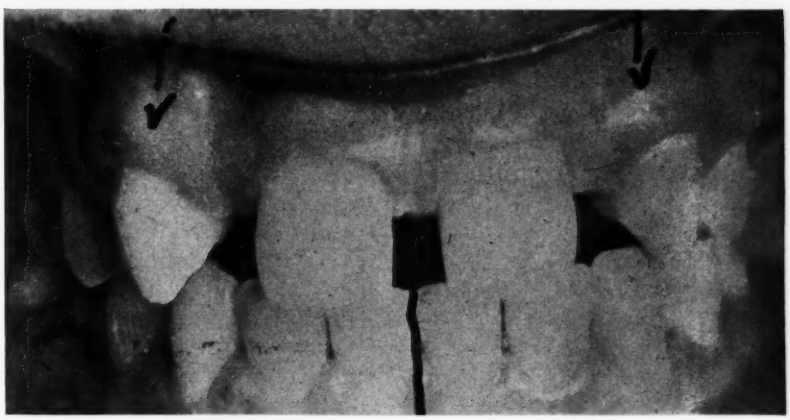

Fig. 2—Note short cuspids and abnormal frenum.

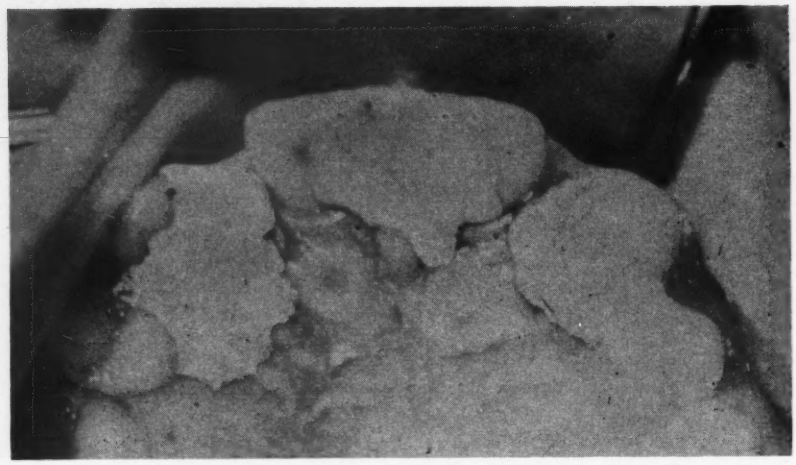

Fig. 3—Dressing after resection of frenum and tissue around cuspids.

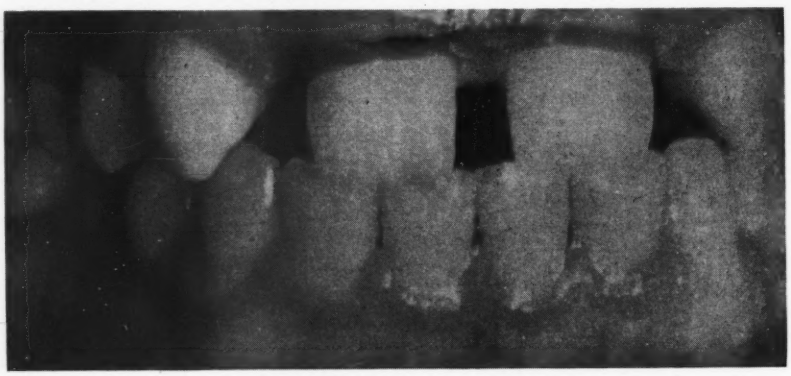

Fig. 4—Rubber band in position.

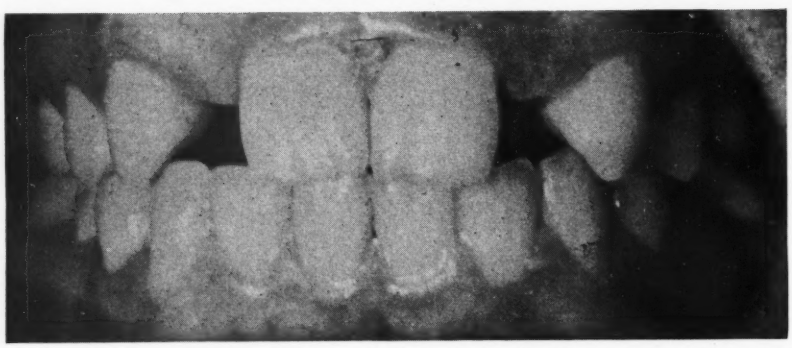

Fig. 5—Result after sixty days of using orthodontic rubber ligature over central incisors to move them in position.

labial gingival tissue was not resected.

3. Local application on cotton twists of a 1:1000 solution of epinephrine was used to control hemorrhage.

4. After application of the epinephrine, a zinc oxide, powdered rosin and eugenol periodontal surgical cement dressing was applied over the areas of operation (Fig. 3).

5. This dressing was allowed to remain in place for six days, then removed. The areas of operation were touched lightly with concentrated silver nitrate crystals fused on a platinum loop and applied to prevent an overgrowth of the gingival tissue; the silver nitrate was then gently washed away with a saline solution.

6. A new cement pack was applied and allowed to remain in place for seven days, at which time it was removed.

7. The patient was taught to keep the areas of operation stimulated thoroughly with a rubber toothbrush and round wooden toothpicks; also, the patient was taught to place an ordinary orthodontic rubber ligature over the central incisors in order to move these teeth into contact (Fig. 4). It required sixty days to accomplish the result shown in Fig. 5.

8. The patient was unable to spare the time to have the bridges placed; therefore, a .012 stainless steel wire periodontal splint[1] was applied around the central incisors in order to retain the teeth in this position.

9. Thirty days later the congenitally missing lateral incisors were supplied by employment of two wing (or cantilever) fixed bridges in which cast gold three-quarter jackets were utilized on the right and left cuspids as abutments for retention. Because of conditions that have been stated, cantilever bridges seemed to be indicated instead of the usual fixed bridge restorations.

Because the cuspids were short and their pulps large in order to secure adequate retention without possible pulp irritation, unorthodox preparations for retention of the three-quarter jackets consisted of two shallow parallel grooves on the mesial and distal of the cuspids; a small shallow hole was prepared in each cingulum for retention of a pin.

10. On account of the close bite, long pin combination cast gold and porcelain pontics with baked root tips could not be used. Steele's facings with baked root tips and cast gold backings, highly polished, were utilized for pontics. The contacts of the pontics on the distal of the central incisors were made tight for a triple purpose: (1) to prevent the centrals from reverting; (2) for additional retention for the wing bridges; and (3) for control of incisal stress on the periodontium of the cuspids. Lingual rests on the wing bridges were not employed. The occlusion was adjusted for centric, protrusive, and lateral relationships. Both bridges were built and completed from a single hydrocolloid impression. By using hydrocolloid technique only two appointments comprising three hours were required for completion of both bridges.

[1]Smith, Rowe: Construction of a Splint in Periodontal Treatment, DENTAL DIGEST, 47:118 (March) 1941.

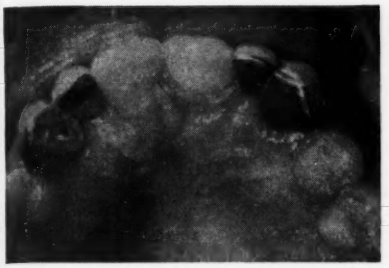

Fig. 6—Lingual aspect of bridges.

Fig. 7—Finished appearance of mouth.

At the first appointment the preparations for the three-quarter abutments were made; then hydrocolloid impressions of the upper and lower dentition, together with the selection of shade, were secured—from these, the bridges were made. On the next appointment, they were completed and cemented to place (Figs. 6 and 7).

Comments

We think that from the points of view of both the operator and the patient the technique presented here is practical, economical, time-saving, and gives excellent esthetic results.

When it is necessary to remove a lower anterior tooth as a result of advanced periodontal disease or apical infection the method of moving teeth described here can be used to close the space without construction of any restoration inasmuch as the converging right and left pressure from cuspid-to-cuspid produces a crowded condition of these teeth.

405 *East Fifth Street.*

A Supplementary X-Ray Processing Technique

LEON M. GECKER, D.D.S., New York City

DIGEST

The installation of the technique described for x-ray processing does not require that tank equipment in use be supplanted. This is considered a supplementary procedure by the author for use when good negatives are required in less than one minute's time.

FOR NINETEEN YEARS I have been using a rapid and dependable processing technique which is herewith described:

Technique

Solution—A stock solution A is made by dissolving in 50 ounces of water, preferably distilled water, the following formula:

Sodium sulphite	4 ounces
Sodium hydroxide	4 ounces
Potassium bromide	7 drams

Powder B is put up in 1 dram vials (one teaspoonful) and consists simply of hydroquinone crystals.

To make a rapid-developing solution, add 1 vial (1 dram) of powder B to 4 ounces of stock solution A in an ordinary drinking glass. (I use a 10 ounce glass graduate and make up 8 ounces at a time.) When completely dissolved the developer is ready for use.

The solution is changed when it becomes too brown from oxidation which occurs in about two months.

Equipment—The following equipment, other than the chemicals mentioned for the solution, will be required: (1) single film clips; (2) a graduate or drinking glass for developing the films; (3) a glass tobacco jar for the fixing solution, with a cover for storing; (4) a dark bottle for storing the developing solution.

Water should be added to the cork of this bottle regularly to eliminate air. This prevents oxidation and discoloration of the solution, and will not appreciably weaken the developer.

The equipment is inexpensive, and, with the exception of the chemicals, may be obtained in any five-and-ten-cent store.

Developing—I develop films by suspending them in a beaker by means of film clips. The films may be developed in a dark room with a red light of 40 Watts, unfrosted bulb (General Electric Mazda). This gives a bright red light by which one can see clearly and does not affect the films. It is more convenient than the dull safe-lights in general use.

Fixing—After they are developed, the films are rinsed in water and fixed in any fixing solution. I use Kodak acid fixing powder which is obtainable anywhere.

As soon as the film has been placed in the fixing solution, the jar containing the films may be brought into the operating room for immediate diagnosis without spoiling the films. The films become fixed in a few minutes and may be examined and replaced in the fixing solution for ten minutes.

The films are washed in running water and hung to dry as is customary.

Time Required—The film is completely developed in from ten to forty-five seconds, depending on the freshness of the solution and the length of exposure of the film.

Advantages

This processing technique makes possible (1) an immediate check-up in root canal procedures while work is in progress; (2) check-up during difficult extractions for fractured roots, location of apexes; (3) prompt initial diagnosis while the patient is in the chair; (4) permanent films which may be filed.

30 *West Fifty-Ninth Street.*

Eliminating the Use of Tin Foil in Processing Acrylic Dentures

ELBERT E. HOLLSTEIN, D.D.S., Pittsburgh

FOILING HAS LONG been a laborious and time-consuming procedure which requires a great deal of subsequent trimming and polishing. I have found a preparation that gives a highly satisfactory separation from the stone model and also reduces the time for trimming and finishing to a fraction of what has heretofore been required. This preparation is a 10 per cent to 20 per cent solution of pure coconut oil soap. The solution can be purchased anywhere. It is an ordinary and inexpensive coconut oil soap solution; the concentration need not be exact. Enough ordinary tap water may be mixed with it to make a 10 to 20 per cent solution.

DIGEST

The use of coconut oil soap is suggested in a technique for processing acrylic dentures in such a way as to eliminate the use of tin foil. The method is suggested as a time saving and labor reducing alternative to tin-foiling for those operators who do their own laboratory procedures.

Technique

1. The cast, as soon as it is recovered from the impression, is placed in a pan and covered with the soap solution and allowed to simmer slowly for thirty minutes. No substance should come in contact with the model prior to soaping. An alternative is to let the cast stand overnight in the solution. The soap need not de discarded. It can be used innumerable times so long as water is added periodically to keep it from becoming too heavily saturated. A sediment which forms in the soap solution after prolonged usage in no way interferes with its efficacy.

2. The model is then held under running tap water and scrubbed to remove any film of soap that may adhere to the surface of the model. A soft cloth may be rubbed over the model to give it a highly polished finish.

3. Following the try-in, the denture is waxed on the model, with gum lines, interproximal spaces, and festoons trimmed as well in the wax as it is to be trimmed in thte finished denture. All wax is thoroughly removed from the teeth with carbon tetrachloride.

4. The case is half-flasked and full-flasked in the usual manner. Vaseline must not be used as a separating medium. Paint the investment with cellulose acetate or soak the entire flask in the soap solution for a few minutes. A mixture of half and half artificial stone and plaster of Paris is used.

5. A small camel's hair brush is used to paint in the interproximal spaces, to prevent the trapping of air bubbles.

6. The case is separated and flushed out thoroughly with boiling water, followed with a small amount of carbon tetrachloride.

7. The upper half of the flask (containing the teeth) is placed in the same soap solution and allowed to soak for about thirty minutes. While this is being accomplished the acrylic may be mixed and prepared for packing.

8. The flask is removed from the soap and flushed under running water, a small stiff brush being used to remove all traces of soap from the teeth. This is important because any soap remaining on the teeth might result in the teeth later pulling out of the denture.

9. The case is now packed and processed according to the manufacturer's directions for the acrylic being used.

10. Deflasking is facilitated if knock-out flasks are used. A few well placed cuts with a hack-saw through the investment over the teeth will aid in prying it off from the outside of the denture. If there are no great undercuts the denture can be pried off the cast.

If the necks of the teeth are thoroughly cleaned of all wax and the case is carefully flasked to prevent air bubbles in the interproximal spaces, the denture will require almost no trimming and little pumicing with brush and muslin wheels.

If the operator desires, he can run a soft brush with whiting over the inside of the denture to secure an even smoother surface.

Advantages

The time and labor saving values of this method are self-evident. The amount of time saved will be equal to the amount of time required to tin-foil in addition to the time required to trim around the necks of the teeth and remove the tin foil from the finished case, particularly from the tissue side. From one half to three quarters of an hour is saved in processing each denture.

The difficulties eliminated are: (1) foiling of the tooth side of the denture; (2) foiling of the cast; (3) the difficulty often encountered in removing the foil from the inside of the denture; (4) the long tedious process of trimming around the necks of teeth, and (5) the discrepancy of the fit caused by the thickness of foil on the tissue side of the denture.

There are advantages derived from soaping the models; for example, facilitating the duplication of models and the ability of such treated models to withstand more abuse because of the hardened surface. Vaseline is unnecessary to prevent wax and trial baseplates from sticking to the model while the teeth are being set up.

1831 *Murray Avenue.*

The Editor's Page

OUR ATTENTION has in the past frequently been directed to the temporomandibular joint in discussing denture prosthesis, and, more recently, in considering the so-called Costen syndrome. In denture prosthesis, we have been concerned to record the condylar position and motions. In the case of the Costen syndrome, we have been interested in the otologic and neurologic disorders frequently produced by the intrusion of the condylar head into the structures of the middle ear or open sensory nerves in that area. Lately, our attention has been called to another condition involving the temporomandibular joint, which, for the most part, has heretofore escaped consideration: the involvement in rheumatoid arthritis.

Bayles and Russell[1] report their observations on the frequent involvement of the temporomandibular joint in rheumatoid arthritis. In their series of cases, 51 per cent of those persons presenting with any of the symptoms of rheumatoid arthritis likewise had symptoms referable to the temporomandibular joint. They submit this warning: "The dentist who encounters patients in his practice with ill-defined syndromes of 'facial neuralgia' or 'stiffness of the jaw' must consider the possibility of these symptoms being early prodromes of rheumatoid arthritis." The authors of this excellent article under discussion state briefly and in passing the difference between Costen's syndrome and the temporomandibular manifestations of rheumatoid arthritis. It is regrettable that they have not given more attention to this differentiation.[2]

Rheumatoid arthritis is, according to Cecil,[3] essentially a disease of the young, the average age of onset being 35 years. Costen's syndrome, however, is usually found in persons over 40. Generally speaking, the symptoms increase with age or as vertical dimension is lost. Rheumatoid arthritis is thought to be an infectious disease; whereas Costen's syndrome, so far as is known, is not caused by any infectious process. In rheumatoid arthritis there may be no change in the vertical dimension in the face nor any disturbance of occlusion; in fact, there may be no change in the position of the condylar head. In the Costen syndrome, on the other hand, there is easily demonstrated a downward and backward displacement of the condylar head as shown both roentgenographically and clinically. There are likewise demonstrated loss of vertical dimension and changes in the occlusion.

The temporomandibular joint is only one of the many joints that may be elected as the site of rheumatoid arthritis, but in the case of this joint the condition may be complicated when normal occlusal balance is lacking. As Bayles and Russell express it: "In certain persons, when there is a lack of molar support or normal occlusive balance, the disk (that is, the interarticular disk) is perforated or completely destroyed by the upward pull of the masseter muscles on the mandible, and if this sequence of events occurs before the onset of rheumatoid arthritis, then bony ankylosis might be expected. It is, however, unlikely, as these degenerative changes in the disk usually occur at a time of life late for the onset of rheumatoid arthritis."

The temporomandibular joint involved in rheumatoid arthritis is usually painful, stiff, and shows limitation of motion. If the disease begins before the growth period is finished, deformity through hypoplasia of the mandible may be expected. In older patients, Bayles and Russell say that arthritis of this joint may lead to severe subluxation, and further, that: "The pull of gravity plays an important part in patients confined to bed, as we have observed subluxation to be most severe in patients kept in the supine position." To prevent this condition from developing in bedridden patients, Bayles and Russell have devised a plaster collar to place against the angle of the mandible.

The treatment suggested comprises physiologic rest, the maintenance of the teeth in centric occlusion, and local heat. After the symptoms have subsided, mild exercises are indicated. These exercises consist of gum-chewing for an hour or two a day followed by the use of a soft sponge-rubber biting appliance. Under such treatment patients may be expected to increase their ability to open the jaw.

Once again, dentists are warned to be on the alert to detect another severe condition—to think in terms of rheumatoid arthritis when young patients present with the complaint of pain and stiffness of the mandibular joint or interference with mandibular function.

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[1]Bayles, T. B. and Russell, L. A.: The Temporomandibular Joint in Rheumatoid Arthritis, J. A. M. A. 116:2842 (June 28) 1941.

[2]In a personal communication to me, Leslie A. Russell writes: "It is our feeling that the Costen syndrome is essentially a set of symptoms caused by degenerative joint changes in the temporomandibular joint which is similar to the symptoms of osteo-arthritis found in other joints and which, as you know, occurs when one isolated joint is affected as the result of wear and tear."

[3]Cecil, R. L.: A Textbook of Medicine, revised, ed. 4, Philadelphia, W. B. Saunders Company, 1938, p. 1286.

The Improved Technique for Locking Simple Inlay Bridges to Place

DAVID W. PHILLIPS, D.D.S., Chicago

DIGEST

The improved technique for locking simple inlay bridges to place is described and discussed primarily with a view to establishing the fundamental principles of this method of insuring the security of the more elementary types of inlay attachments. This technique is not submitted as a cure-all for bridge problems, but intelligently adapted, it conserves tooth structure, increases the security of bridges, and saves time.

Although the fundamentals of the technique have been previously described[1] the same questions continue to be asked after papers and during clinics. Clarification of certain points, therefore, seems indicated here.

Elementary, routine inlay preparations, Black's or slice, can be placed and quickly converted into unusually secure bridge retainers in less time than is required to construct the complicated types of bridge retainers and with even greater assurance of secure retention.

The use of this locking technique, however, is not confined to elementary attachments. Retention can be assured by locking almost any retainer. The various modified retainers, extracoronal and intracoronal, pinlay, and pinledge, if one prefers them, may be locked similarly on an axially inclined margin from the buccal or labial approach.

It is suggested that the technique be used a few times first in its simplest and quickest application: for immediate gold inlays.

THE SPECULATIVE RETENTION of elementary inlay bridge retainers, which are cement-frictionally attached, has resulted in a constantly growing tendency to use the more involved attachment preparations covering a larger number of surfaces of the abutment tooth. But the simpler types of inlay attachments can be made even more retentive than the more difficult and destructive preparations so necessary with cement retention. This is easily accomplished by quickly locking simpler attachments to their abutment teeth superficially on an axially directed buccal or labial margin after the bridge has been constructed and cemented to place.

[1]Phillips, D.W.: Positive Mechanical Bridge Fixation, J.A.D.A. 27:14 (September) 1940; The Clinical Aspects of Mechanical Bridge Fixation, ibid. 28: 732 (May) 1941. Immediate Gold Inlays, DENTAL DIGEST, 46:302 (September) 1940.

Placing of Precision Lock Pin

A tiny, hard gold, precision lock pin, only 1¼ mm. in diameter and 1⅝ mm. in length is placed on an axial margin of the inlay attachment perpendicularly to the surface of the tooth and inlay, half into the gold and half into the tooth structure (Figs. 1 and 2). These pins are placed, not as we have been using them, parallel to the direction of exit of the casting from its preparation, but at a right angle to it. The inlay attachment is thus mechanically locked to the tooth on a surface margin by the pin's resistance to shear, and the inlay cannot be removed from its preparation without first removing or shearing the shallow lock pin.

Materials

Three new-type precision drills (Fig. 3) are used: (1) a roundly-pointed starter; (2) a flat end-cutter, and (3) a beveler (Ransom & Randolph). These have been developed to cut cylindrical cavities of exact pin diameter and depth with precisely beveled margins conforming to the beveled head of the pin. All three are designed to cut only to a fixed diameter and all have a protective means for stopping their cutting exactly at the correct depth. It is impossible to cut too deeply and endanger the pulp with any of them (Fig. 6).

The oversize straight and angle handpiece drills and the corresponding oversize handle-pins (Fig. 3) are used instead of the regular size when it is necessary to enlarge a cavity for an immediate gold inlay or to perfect centralization on a margin in the locking technique. The oversize drills and handle-pins are larger only in diameter. Many dentists have informed me that they use them for all immediate gold inlays for that reason.

Fig. 1

Fig. 2

Fig. 1—Lock cavity preparation on the disto-labial margin of a mesio-linguo-distal inlay attachment in a cuspid. Preparations for inlay attachments in anterior teeth are made to permit the casting to exit in an incisal direction; likewise, conservative inlay attachments for bicuspids and molars exit occlusally and are similarly locked on the convenient buccal margin. The notches made during lock cavity preparation in the gold and tooth structure grip the pin for reciprocal anchorage, mechanically to lock the attachment to its abutment.

Fig. 2—Handle-pin in place for verification of its fit. Because the pin has beveled head the diameter of the lock cavity and pin below the surface is less than that of the head shown.

Angle-handpiece drills are usually used for immediate gold inlay preparations (Fig. 6). Because of the manner in which the locking technique is applied the straight handpiece is almost always used for that purpose. Drills for the angle and Densco handpieces should be used whenever the drills cannot be held at a true perpendicular to the surface with the straight handpiece.

A new kind of hard gold lock pin (Thomas J. Dee & Co.) is the other development (Figs. 2 and 3) that made this technique possible. It is equipped with a slender handle without which it would be almost impossible to place so tiny a pin and to remove it after fit verification. For cementation the handle is held in a rongeur or small wire cutter and when the pin is seated a little hand pressure severs the handle—all in one movement.

If one has no rongeur (Fig. 8), he may use instead a small radio wire cutter to hold the handle-pin and snip off its handle (Fig. 8). This cutter is inexpensive and is available at most hardware stores.

Advantages

Direct Vision and Direct Access—Castings for all teeth are locked on their buccal or labial margins, from which approach there is direct vision, and the convexity of the arch affords excellent access for the straight handpiece for lock-cavity preparation (Figs. 4 and 5).

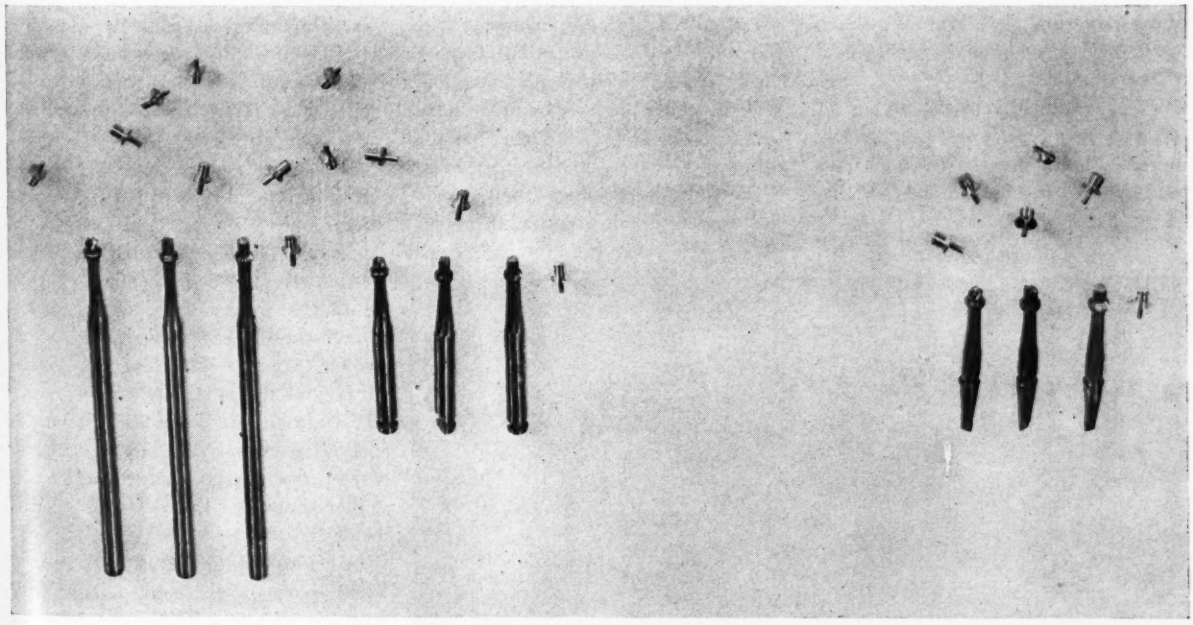


Fig. 3—At the left are sets of regular size drills for the straight and latch handpieces with the corresponding regular size gold handle-pins. At the right is a set of oversize drills for the Densco handpiece with the corresponding oversize handle-pins. Oversize drills as well as the regular size are made for all handpieces. Note that the drills are all end-cutters, to an exact, limited, diameter, and that the shoulders of the first two drills and the smooth projecting cylinder of the beveler stop the cutting at the exact predetermined depth; thus the lock cavity is cut to precisely controlled dimensions.

Fig. 4—Mesio-buccal view of an upper right fixed bridge restoring two bicuspid pontics. The bridge has been cemented to its abutments, after which the lock cavity preparations were made. Note the lock preparation on the mesio-buccal margin of the mesio-occluso-distal retainer in the molar and the generous access afforded for lock cavity preparation with the straight handpiece by the absence of the porcelain facings of the pontics.

Here the absence of the porcelain facings of the pontic also affords generous direct access to the margins for surface locking.

Mechanical Fixation[2]—It should be kept in mind that the technique provides the benefits of strong mechanical fixation in addition to the normal retention of the cement; thus it is no longer necessary to depend on cement alone for the retention of conservative bridge attachments. Except in the field of dentistry, one piece is always welded to another, or soldered, or mechanically locked in place.

The speculative retention of an anterior three-quarter crown also can be increased to the point where it even exceeds that of a cement-attached molar three-quarter crown. Although anterior three-quarter crowns are constructed for teeth that are somewhat short or prepared with their axial grooves slightly too divergent, they can be converted to extremely retentive, dependable bridge attachments by locking. Mechanical fixation is so effective that it is rarely necessary to use more than one small superficial lock pin.

Simplified Cavity Preparation—With retention assured, cavities may be prepared for bridge attachments without extending or deepening them to meet the requirement of retention alone. Now by using preparations with boxes of normal, biologic depth, without deepened occlusals, and with isthmuses between the cusps widened only enough to provide sufficient strength in the gold, it is possible to finish with stronger teeth, with stronger cusps, as well as with stronger retention.

In cuspids as well as posterior teeth the more elementary, intracoronal preparations, such as a locked mesio-linguo-distal (Fig. 1), may often be substituted for a three-quarter crown. Like the three-quarter crown they are prepared to exit incisally, the axially inclined walls paralleling the incisal two-thirds of the labial surface. The intracoronal preparations are also conveniently locked from the labial approach either on the mesial or on the distal margin. Preparations for these locked retainers need not be deep, because in this technique retention depends on sound mechanics instead of on depth of preparation or great tooth coverage.

Increased Retention—A locked mesio-occluso-distal attachment (Figs. 4 and 5) is more retentive than any more difficult, cement-attached retainer involving a larger number of surfaces of the tooth.

A careful analysis of the torques that have been loosening fixed bridges reveals that the unusual retentive efficiency of a small pin, superficially placed at a right angle to the casting's direction of exit may be attributed to its placement at the particular point where it can most effectively resist dislodging torques, the resolution of the forces of which is effective in breaking the cement bond between the casting and its preparation.

Even the despised proximo-occlusal attachment, in favorable posterior teeth, takes on a new usefulness when locked, and when properly executed, can now be depended on for secure retention of any correct one-tooth replacement. I have several cases in which this minimum retainer, locked in favorable first molars, for years has successfully supported two bicuspid pontics as the distal attachment. Ordinarily the use of a two-surface retainer should be limited to one-pontic bridges.

A mesio-occluso-distal inlay attachment is usually the retainer of choice in a posterior abutment, and, in the absence of any precluding condition, can be used for any bridge of biologic span with even more assurance of fixation

[2]Footnote 1, first reference.

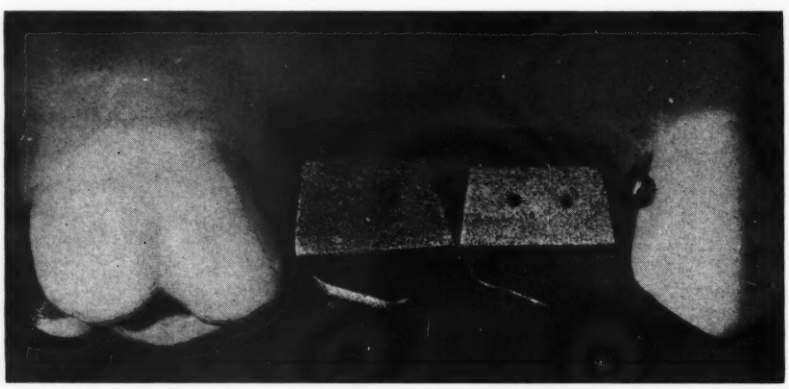


Fig. 5—The labio-buccal view of the same bridge showing also the lock cavity preparation on the disto-labial margin of the three-quarter crown in the cuspid. A mesio-linguo-distal inlay retainer would be locked in the same convenient maanner.

than is offered by a cement-attached full crown.

A disto-lingual attachment for an anterior tooth, properly prepared to exit incisally, can also be locked on an axially inclined margin. This locked attachment can be used with certainty now to receive the rest lug of a semi-fixed bridge to prevent a common, unfortunate bridge failure: the loosening of the small, minor attachment. When this occurs the soldered attachment and its pontic must be removed to restore the minor attachment.

Simplified Wax Patterns—The simplification of bridge attachment preparations also simplifies the taking of wax patterns to such an extent that usually patterns can be secured by the direct method for the more elementary attachment preparations which may be used with this technique.

Biologic Benefits Increased — Increased retention and simplification of preparation are not the only advantages of this method. The biologic benefits should be emphasized. Who of us has not experienced the disappointment of having hyperemic pulps and their sequelae occur in the teeth supporting bridges after they were finally placed? The addition of mechanical fixation to the customary cement retention permits preparations to be made in full accord with the bio-mechanical concept of modern dentistry: minimum tooth coverage, the shortest possible gingival margins of attachments, as well as moderate depth in cavity preparation.

Unlike the manner in which pins have been applied in the past; namely, longitudinally, by further deepening the deepest part of the cavity, these tiny pins are superficially placed on a surface margin without deepening the preparation already made. The delicacy of this technique permits us to meet another important biologic requirement: a surface bevel on the lock cavity and its restoration.

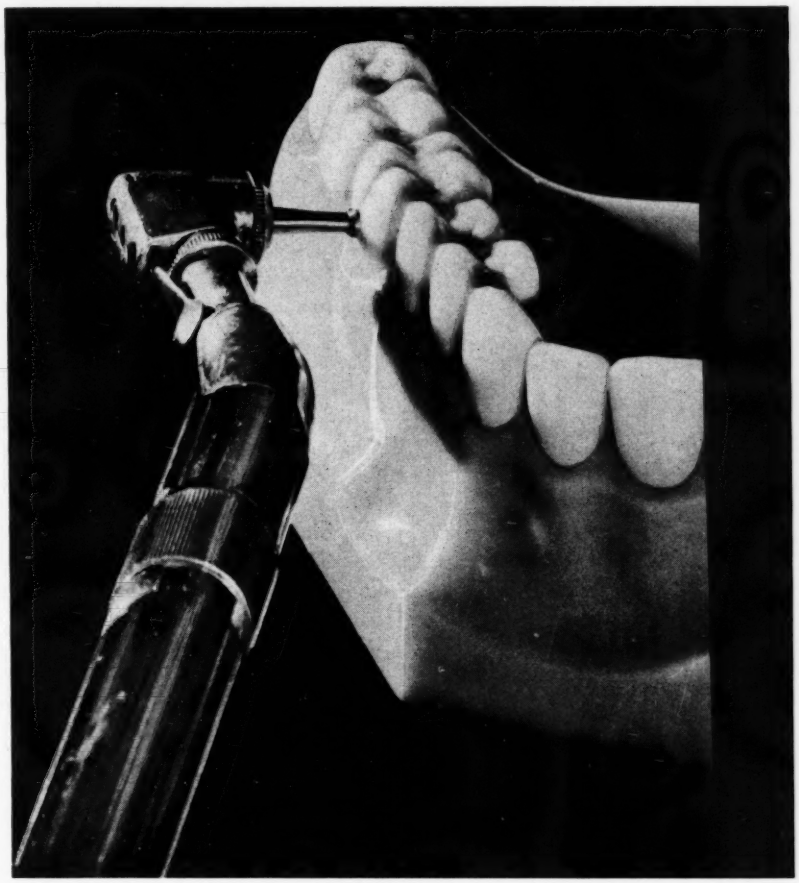


Fig. 6—Manner in which depth-limiting shoulders of these drills stop their cutting for absolute pulp protection. By making the drills non-side cutting the diameter as well as the depth of the lock cavity is held to precise, restricted dimensions.

Technique

1. Carefully construct the bridge and fit it to the teeth, ready for cementation but without the porcelain facings of the pontics attached.

2. Remove the bridge and cut a tiny notch with a thin carborundum disc, 2 mm. or a little more from its gingival angle, across the attachment margin where it will be locked after cementation. The small lock cavities are always started 2 mm. or a little more, occlusally or incisally of the gingival angle of the casting. Three-quarter crowns for all teeth can also be locked to their abutments in the same way. (This suggestion was made by E. C. Karr of Decatur, Illinois at a recent Illinois State Dental Society meeting.)

3. Cement the bridge to the abutment teeth without its porcelain pontics (except in the case of the deep saddle type).

4. To prevent unseating the attachments, do not start the lock-cavity preparation until the cement has completely set. Hold the attachments tightly seated, preferably by the patient's biting on a small rubber block.

5. Starting a small fissure bur in the little notch cut on the margin, make small cuts equally into the enamel and gold to receive the point of the starter, drill 1 (with roundly pointed cutting end), perfectly centralized on the margin of the attachment.

6. All drills are firmly held, always at the same angle, perpendicular to the surface of the tooth and each is embedded straight into the tooth as far as its self-stopping means permits. Their knives and the cavity are cleaned between all cuts.

7. Use the flat end-cutter, drill 2, with water dropped on it, and finish with the beveler, number 3.

8. Verify the fit of the handle-pin. If it does not seat perfectly, repeat the cuts with numbers 2 and 3 drills to make sure that they have cut to their accurate maximum.

9. Cementation: Grasp the handle of the pin where it joins the head in a rongeur or small wire cutter (Fig. 8). Apply the cement to the cavity and pin;

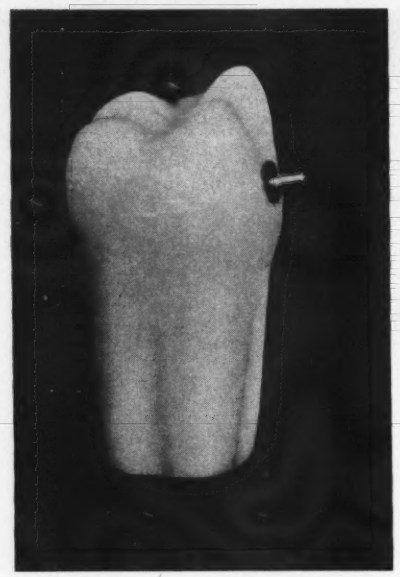


Fig. 7—An immediate gold inlay for a buccal pit cavity placed for verification of its fit. Inlays by this technique have better margins than cast inlays, although they can be placed in less than one-fourth the time. This illustration reveals the precision fit of the pin even before its margins are burnished. The ease of placing the pin and especially of removing it by its handle after fitting and the simplicity of cementation are obvious.

place the pin in the cavity and pinch off the handle in the same movement. Immediately seat the pin firmly.

10. After the cement has set fully, finish with small sandpaper discs; then cement the pontics to the bridge.

When the gold handle-pins are used as immediate inlays in pits on the occlusal surfaces of bicuspids or molars, the part of the cusps about the pit are first flattened a little with the end of a small cylindrical stone, so that part of the cusps will not stop the depth-limiting shoulders of the drills too soon.

There is a particular reason for the unusual marginal adaptation afforded by this technique (Fig. 7). The small pins are made three-thousandths inch shorter than the depth to which the drills cut, so that the pin does not touch the floor of the cavity but is stopped instead by the intimate contact of the beveled head of the pin on the surface margin of the tooth. Fine marginal adaptation is further facilitated by making the diameter of the cylindrical part of the pins two-thousandths inch less than that part of the cavity, to permit the easy escape of excess cement.

Comments

Probably nothing has so conclusively proved the retentive efficacy of this technique as the successes so many operators have reported in replacing and then locking bridges formerly cement-attached which had, without caries, loosened repeatedly. For this reason alone many have informed me that they now retain all bridges with locked conservative attachments.

Immediate Gold Inlay Technique[3] (Fig. 7)—The technique of cutting precise cavities accurately to fit pre-formed precision gold pins has proved so practical and time-saving that already it is being used even more to place immediate gold inlays in one sitting in small, one-surface cavities on accessible surfaces of the teeth: buccal, lingual, and occlusal. They can be placed even more quickly than amalgam.

Further Immediate Inlay Uses—Some operators have been reporting that they lock any inlay subject to more than ordinary displacement forces; an inlay sustaining the retentive bearing of a clasp, for instance.

[3]Footnote 1, last reference.

H. D. Grubb of Cleveland states of the immediate gold inlay technique: "It is a convenient and accurate method of restoring the openings which I make in all cast crowns before cementing."

L. K. Campbell of Newton, Iowa, regarding a fracture case in which it was impossible to place ligatures in the usual manner, reports: "A handle-pin was utilized by soldering a loop to it and inserting this in the buccal pit of the first permanent molar, and from this loop interdental ligation was completed. The pin remained during healing of the fracture and held the fractured parts securely."

Several dentists have reported the restoration of small holes worn in the occlusal surfaces of gold shell crowns with immediate gold inlays.

Miss Mary Kelly, a dental assistant, of Crown Point, Indiana has suggested immediate gold inlays to repair buccal or occlusal openings prepared in full crowns to facilitate their removal.

Orthodontic uses of the immediate gold inlay have also been suggested but there have been no case reports.

2376 *East Seventy-First Street.*

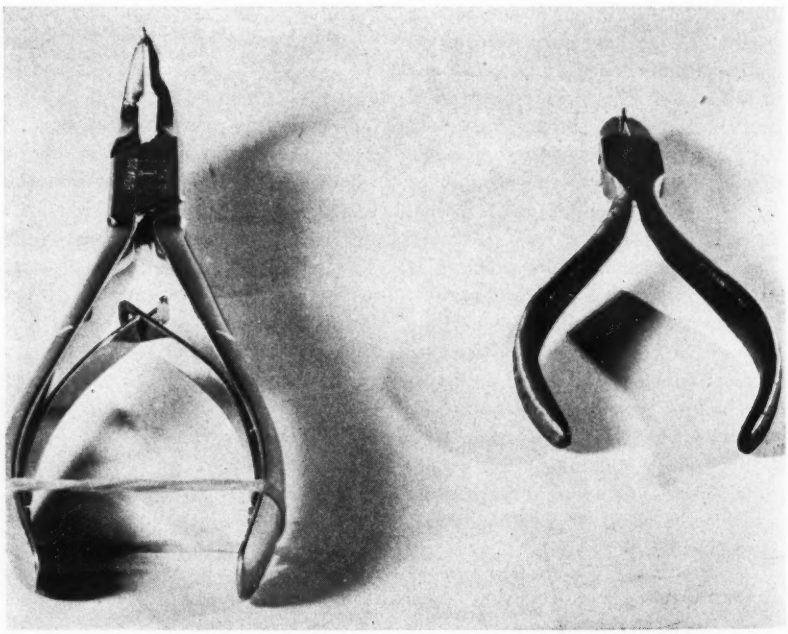


Fig. 8—Manner of grasping the handle of the pin where it joins the head in the beaks of the rongeur or small radio wire cutter for centation. Because our rongeur spring opens the beaks when hand pressure is released, I usually wrap a rubber band around the rongeur handle as illustrated, after the pin has been placed in the beaks, so that the pin will be held in place in the beaks when the rongeur is set aside preparatory to cementation. The rubber band is not removed until the handle has been pinched off the instant the pin is seated with the cement. This convenient bit of technique keeps everything in readiness and prevents dropping the pin during cementation.

Cause and Control of Shrinkage Porosity in Inlay Casting

JOHN L. WILSON, D.D.S., Indiana University School of Dentistry, Indianapolis, Indiana

DIGEST

Metallurgical principles are set forth which explain the fundamental cause of porous inlay castings. Alternative methods of preventing shrinkage porosity, either by the use of a short large sprue or a medium size sprue, are suggested. These methods, the advantages and limitations of each of which are given, provide for additional molten metal to be drawn into the mold to furnish the areas that solidify or freeze last, thus controlling shrinkage and preventing "voids" or areas of porosity.

THE PROBLEM of porous inlay castings has been of more or less concern to dentists ever since the casting process was introduced into dentistry. Many are puzzled to know why they can make one casting that is apparently solid, and then the next one may be porous in the region where the sprue wire was attached. Although the casting may fit well the dentist hesitates to set the inlay in that porous condition. Often the remedy is to flow solder over the porous area and forget the defect. This treatment may suffice, but is not in keeping with ideal dental practice.

Metallurgical Principles[1]

An understanding of some of the fundamental principles of the metallurgy involved is helpful in producing porous-free castings.

Metals are difficult to define accurately. They do have, however, certain characteristics in common. Generally speaking, they are crystalline when solid and all have definite melting points. They belong generally to the cubic system of crystallization, gold belonging to the face-centered cubic system.

Alloys—For the most part metals used by dentists for inlay castings are not pure metals but are alloys. An alloy is sometimes defined as the union of two or more metals effected by fusion. This definition is not entirely correct, but will serve for this discussion. It implies that the metals entering into the alloy are mutually soluble in one another when molten, and when solid give no indication that the alloy is composed of two or more metals. An alloy formed in this manner is called a solid solution.

Metals joined together in such manner lose the characteristic of fusing at a definite temperature and fuse while passing through a temperature range. This range is not readily predicted by an average of the fusing points of the metals involved.

The variation between the points of temperature through this range may be considerable, often as much as 150° F. or more. Fig. 1 is a cooling curve of a popular inlay alloy and shows the variation of temperature through which this alloy passes while cooling from the molten to the solid state.

An examination of the graph reproduced in this figure shows that the alloy begins to harden at about 1800° F. and that at about the same temperature its cooling is slowed down for a short time and then continues to progress more rapidly until the final freezing is completed at about 1630° F. It is seen, therefore, that this particular alloy has a fusion range of about 170° F.

Dendrites—Metals cooling from the molten to the solid state pass through a process of crystallization beginning at centers called nuclei. From these nuclei the crystals begin to grow by throwing out prolongations in all directions, shaped somewhat like a fern leaf. These growths continue until they are arrested by contact with another growth, or some other obstruction. They are called dendrites and are the skeletons of the space lattice. This phenomenon proceeds in three dimensions, and when completed the result is a series of crystals or grains not definitely oriented, but making up the entire mass of the metal.

Shrinkage Porosity—Dendrites begin their formation at the highest temperature of the cooling range. As their growth progresses and the temperature

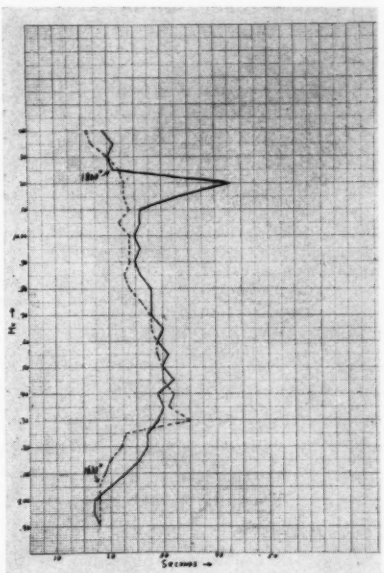


Fig. 1—Fusion and cooling graph of a common dental gold alloy. The dotted line is the fusion graph and the solid line, the cooling graph.

[1]Rosenhain, Walter: Introduction to Physical Metallurgy, London, Constable and Co. Ltd. Coleman, R. L.: Physical Properties of Dental Materials, Research Paper No. 32, Bureau of Standards Journal Research, December 1928. Skinner, E. W.: The Science of Dental Materials, Second Edition, Revised, Philadelphia, W. B. Saunders Company, 1940. Shell, J. D.: Hodgen-Shell Dental Materials, St. Louis, The C. V. Mosby Company, 1938. The Encyclopedia Britannica, Fourteenth Edition.

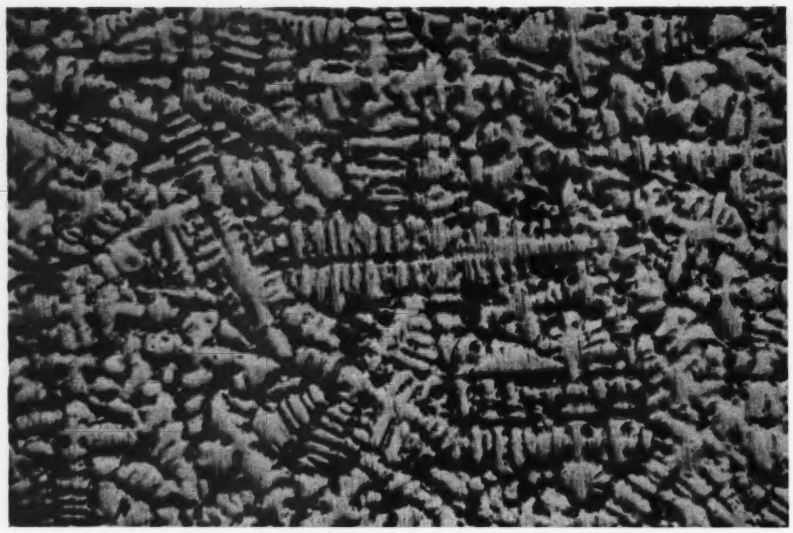


Fig. 2—Photomicrograph (X140) of a gold alloy, showing dendritic formation, characteristic of all solid solution alloys. The light areas are the dendrites. (Specimen for Figs. 2, 3, and 4 prepared with the assistance of Mr. Ralph Phillips under the direction of Dean William H. Crawford.)

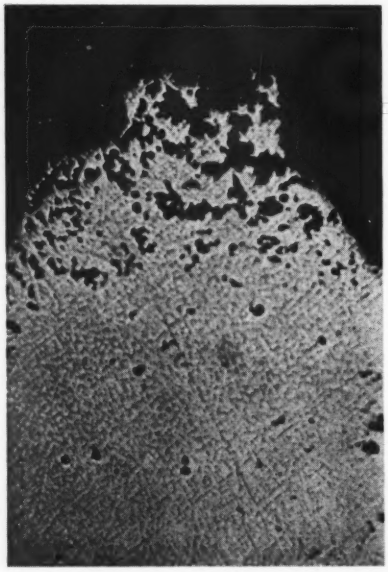


Fig. 3—Photomicrograph (X50) of a cross section through casting at point of attachment of long, small sprue. Very porous. Sprue detached itself when casting was removed from investment.

falls, metals of the lower region of the cooling range are added to them. At this stage a shrinkage takes place and unless molten metal is available to complete the forming crystals, voids are formed, thus producing what is called shrinkage porosity in the portion of the metal which freezes last.

Fig. 2 is a photomicrograph showing the dendritic formation of a common gold alloy for inlays. The light areas are the dendrites and the dark areas, the voids between them. It is these voids that must be filled as freezing progresses, or porosity will result.

Prevention of Porosity

With these phenomena in mind it should be possible to arrange a technique that will prevent this kind of porosity.

In making an inlay casting the molten metal is driven into a mold through an opening called a sprue.[2]

When the molten gold comes in contact with the plaster mold which is several hundred degrees colder than the metal, it begins to cool rapidly and is soon frozen in the thinner parts of the inlay and in parts farthest away from the ingate into the mold.

The parts of the casting that solidify first are able to receive molten metal to complete the hardening process, but unless some way is provided to furnish molten metal to the areas freezing last, porosity is almost sure to result. Fig. 3 shows a photomicrograph of a cast made without proper provision for additional metal to be drawn into the mold to complete the freezing process. Castings made in this manner will usually be porous, as the photomicrograph shows.

There are several ways to provide this additional metal:

1. *Use of Short, Large Sprue*—A simple method is the use of a short, comparatively large sprue attached to the most bulky portion of the pattern when it is invested. By a short sprue I mean one about 5 mm. in length. Judgment should be used in the selection of a sprue, so that it will be in proportion to the size of the cast to be made. For a large casting a sprue of 12 or 14 gauge may be used with safety. There is no danger of the molten gold dropping into the sprue hole even though a pressure machine is used. The surface tension and tendency of molten gold to become spheroid will prevent any such accident.

[2]Crawford, W. H.: Selection and Use of Investments, Sprues, Casting Equipment and Gold Alloys in Making Small Castings, J. A. D. A. 27:1459 (September) 1940.

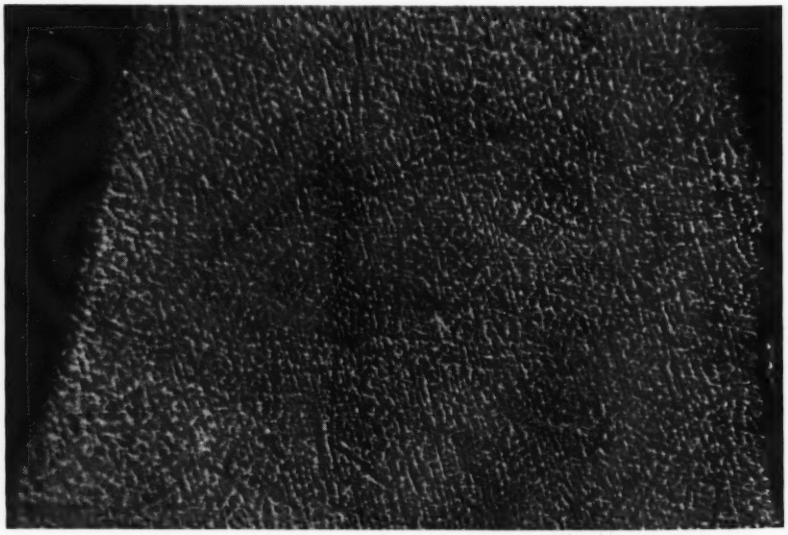


Fig. 4—Photomicrograph (X50) of a cross section through casting at point of attachment of a short, large sprue wire. No porosity shows in this casting.

If a sprue of proper size and length is used the different stages of freezing in the cast have time to complete themselves before the gold in the sprue becomes frozen and metal will be drawn in from the button of excess gold to fill the porous areas, thus producing a solid cast. Fig. 4 shows a cast made by carrying out these principles. The result is a non-porous cast. The cast shown in Fig. 3 was made exactly like the one in Fig. 4 except that a long, small sprue was used which permitted the gold in the sprue to freeze before it was completely frozen in the mold, thus preventing the feeding of molten metal into the mold and resulting in a porous area in the region where the metal entered.

2. *Use of Medium Size Sprue*—Another method often resorted to is the use of a medium size sprue. The sprue is attached to the bulky portion of the pattern as in the previous method, but a ball of wax is added to form a puddle about one sixteenth of an inch from the pattern, enlarging the sprue between the ball of wax and the pattern sufficiently to allow the metal in the mold to freeze before it does in the puddle and the enlarged sprue.

If this method is properly handled it gives satisfactory results. There is, however, a danger involved which should be understood. Unless the ball of wax used is large enough to provide a puddle that will remain molten until the metal in the mold is frozen the process of feeding gold is apt to be reversed and metal will be withdrawn from the mold into the puddle. This would result in a more porous condition of the cast, the opposite of the desired result.

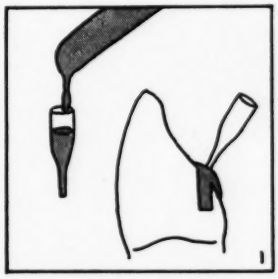
1121 *West Michigan Street.*

Accurately Fitting Pins With Maximum Retention

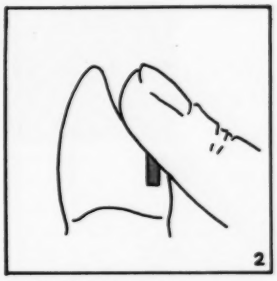
HERSCHEL S. GLICK, D.D.S., Los Angeles

In making pinledges by the direct method, it is impossible to cut platinum pins that fit the countersunk holes accurately. A well made cast pin is ideal, but taking a wax pattern of a small hole is difficult because of air entrapment, rapidly cooling wax, and the absolute necessity of holding any wax pattern under pressure until cool. A method so simple that it must be known to others has solved the problem for me. It is shown in the accompanying illustrations, representing how a supplementary pin is made on a carmichael crown, but the method may be used for numerous purposes.

3200 *West Sixth Street.*



Hold a stick of inlay wax over the flame and quickly melt a drop or two into a small celluloid cement placing tube. Transfer the wax to the prepared tooth. Fill the hole to excess.



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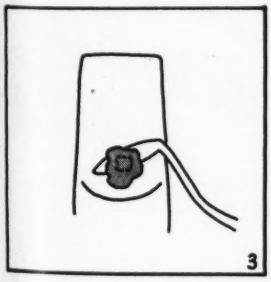
Press with thumb or finger and hold while cooling.



Trim the excess wax down to the edge of the hole. (When two or more pins are to be used on the same casting, great care must be exercised to make the preparation of the holes parallel.)

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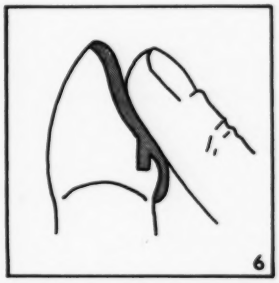
A wax pattern is taken in the usual manner.

Before the pattern is removed, a blunt number 3 explorer is heated and plunged through the pattern into the wax-filled hole; thus, the pin pattern is luted to the over-pattern.



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Hold this spot under thumb or finger pressure until cool.

THE RYAN EXAMINATION AND TREATMENT RECORD

Designed by Edward J. Ryan, D.D.S.
Copyright by Dental Digest, Inc. 1937.

NAME _____

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CITY _____ TELEPHONE _____

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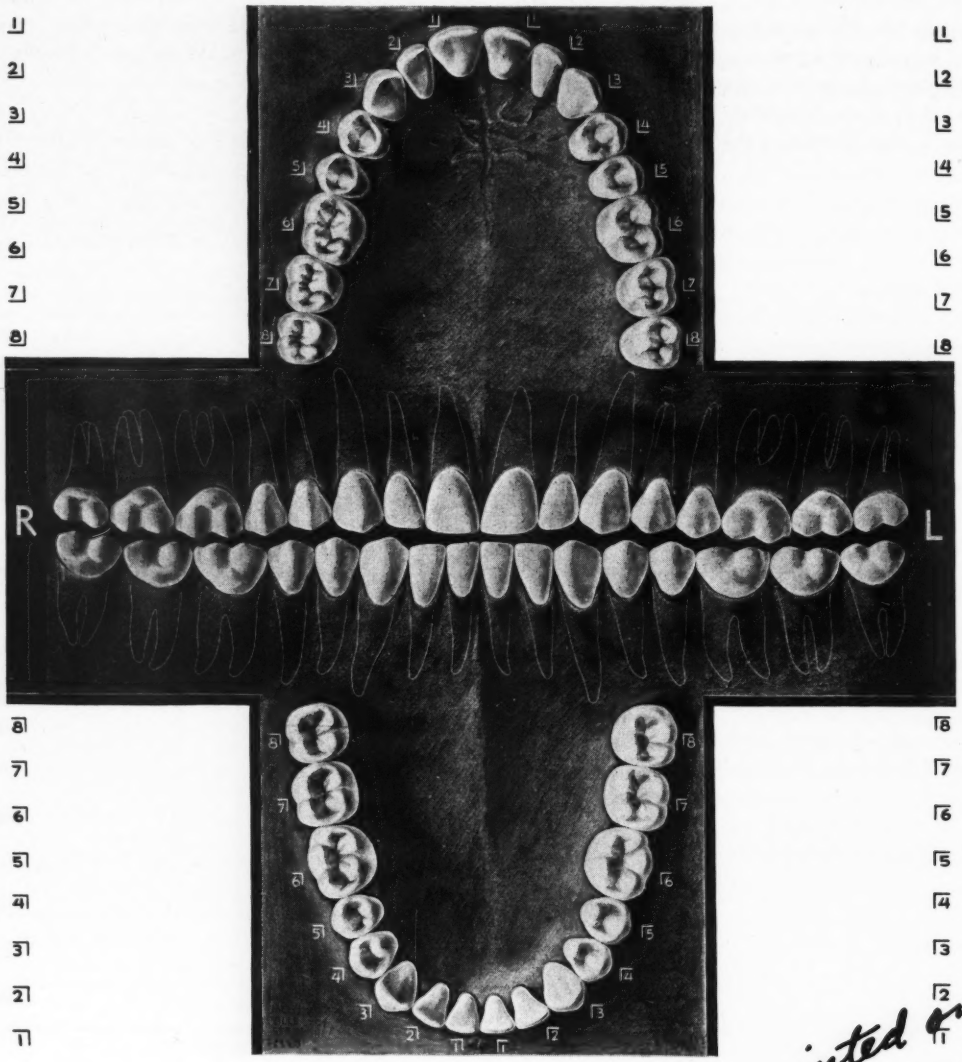
ESTIMATE _____ TERMS _____



CLINICAL NOTES

Specimen of chart which is printed on white, durable paper of the right texture for crayons or colored pencils

Suggestions for the use of

The Ryan Examination and Treatment Record

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OVER

125,000

CHARTS

NOW IN USE

BY DENTISTS

EVERYWHERE

•

TYPES OF PENCILS

Yellow	Mongol No. 867
Gray	Mongol No. 819
Red	Mongol No. 866
Blue	Mongol No. 865
Yellow	Castell No. 40
Gray	Castell No. 57

Mongol pencils are made by Eberhard Faber; Castell by A. W. Faber.

SUGGESTED SYMBOLS

Each dentist may develop his own system of symbols but the following specific markings have been found simple and adequate:

Soft Lead Pencil—(a) Porcelain fillings are indicated by a pencil outline.

(b) Porcelain jacket crowns and bridges are shown by cross-hatching with lead pencil across the corresponding tooth or teeth on the chart.

(c) Missing teeth are blocked out with a soft lead pencil.

(d) Abrasions are represented with a soft lead pencil.

Blue Pencil—(a) Cavities are indicated with blue pencil.

(b) Advisable restorations are demonstrated with blue pencil.

Red Pencil—(a) A red line is used to indicate the presence of a root canal filling.

(b) A red outline shows the presence and position of an impacted tooth.

(c) Red pencil is used to represent pulp involvement.

(d) A red "X" is made across a tooth to indicate that its extraction has been advised.

(e) Pyorrhea pockets are represented in red along the crest of the alveolar ridge (and a notation is made at the bottom of the chart if extensive gingivitis is present).

1. The Ryan Examination and Treatment Record may be had in pads of fifty charts each. These pads fit conveniently in a standard 9½ by 11½ inch loose-leaf notebook which may be purchased at a five-and-ten cent or variety store.

2. Alphabetical dividers may be made by using a ten cent package of plain white paper of the same size as the charts with holes punched at the same distances, and a fifteen cent box of alphabetical index tabs. The holes are reinforced.

3. It is a good plan to keep a blank sheet of paper between the charts to prevent possible smearing of crayon or pencil markings; but this is not essential.

4. A fresh pad of charts may be kept ready for use in back of the notebook of active records.

5. The various types of restorations and their location in a particular mouth are shown with the use of polychrome pencils—gray, for amalgam; deep yellow, for gold. White pencil does not show up very well; consequently, porcelain may be indicated with soft lead pencil outlines or cross-hatching.

6. Spaces provided beside the quadrants with numbers corresponding to the teeth permit special notations concerning each tooth. As treatment progresses the blue markings indicating needed dentistry are erased, and the nature, location, and date of placement of each new restoration are recorded. Additional clinical notations are made if necessary in the space provided for that purpose below the chart itself.

7. It is essential to be consistent in any system of symbols or markings developed. To insure consistency, it is well to have a key page in the front of the notebook.

8. The exact record of conditions found in the average patient's mouth at the original examination can be completed in fifteen or twenty minutes, and the time it takes to keep a chart up to date is negligible.

9. When a chart is completed the necessary data (name, address, telephone, reference, estimate, and terms) are typewritten in the spaces provided at the top of the record. The date of the original examination is also recorded in order that the treatment dates (as shown in the quadrants at the sides of the chart) will be recognized as subsequent to the date of the original examination.

10. Provision is made on the back of the chart for bookkeeping records. This is merely for the convenience of dentists who wish to keep all records together, but may be ignored by dentists who have a satisfactory bookkeeping system which they need not discard or do not wish to discard. The Ryan Examination and Treatment Record may be employed as an additional or supplementary record to any established method of record-keeping dentists may have.

11. Although the Ryan Examination and Treatment Record was designed for the dentist's own convenience in his practice, the charts have been found to have a definite informative value in explaining conditions to patients. The charts are also particularly helpful in reporting dental conditions of patients to cooperating physicians.

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Here is $1.00. Please send me a pad of 50 Ryan Examination and Treatment Record Charts.

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TIME was when pain had to be borne with patience and fortitude as one of life's inescapable burdens. But today there is at hand, almost always, some degree of relief from the weary plod along the furrows of pain.

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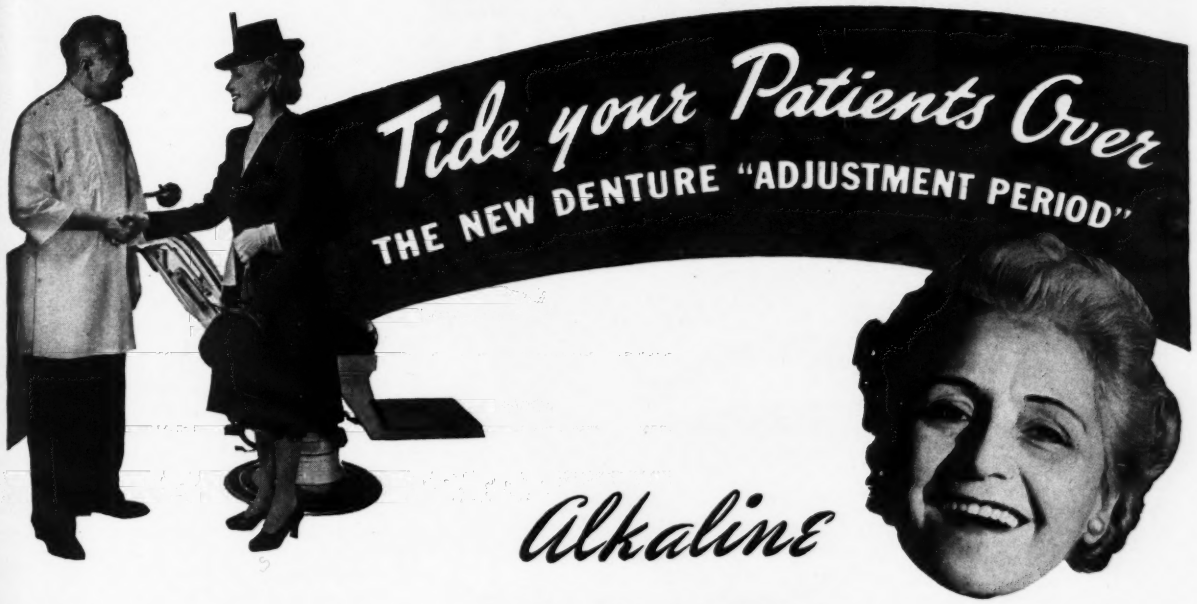

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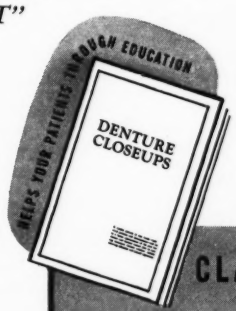

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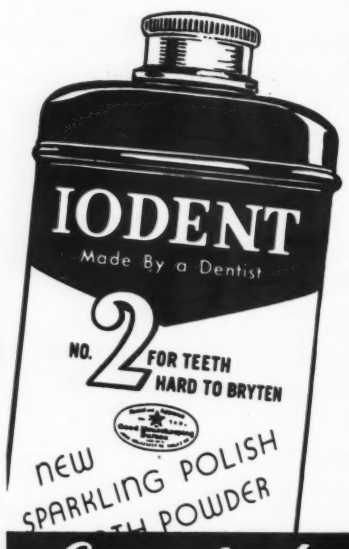

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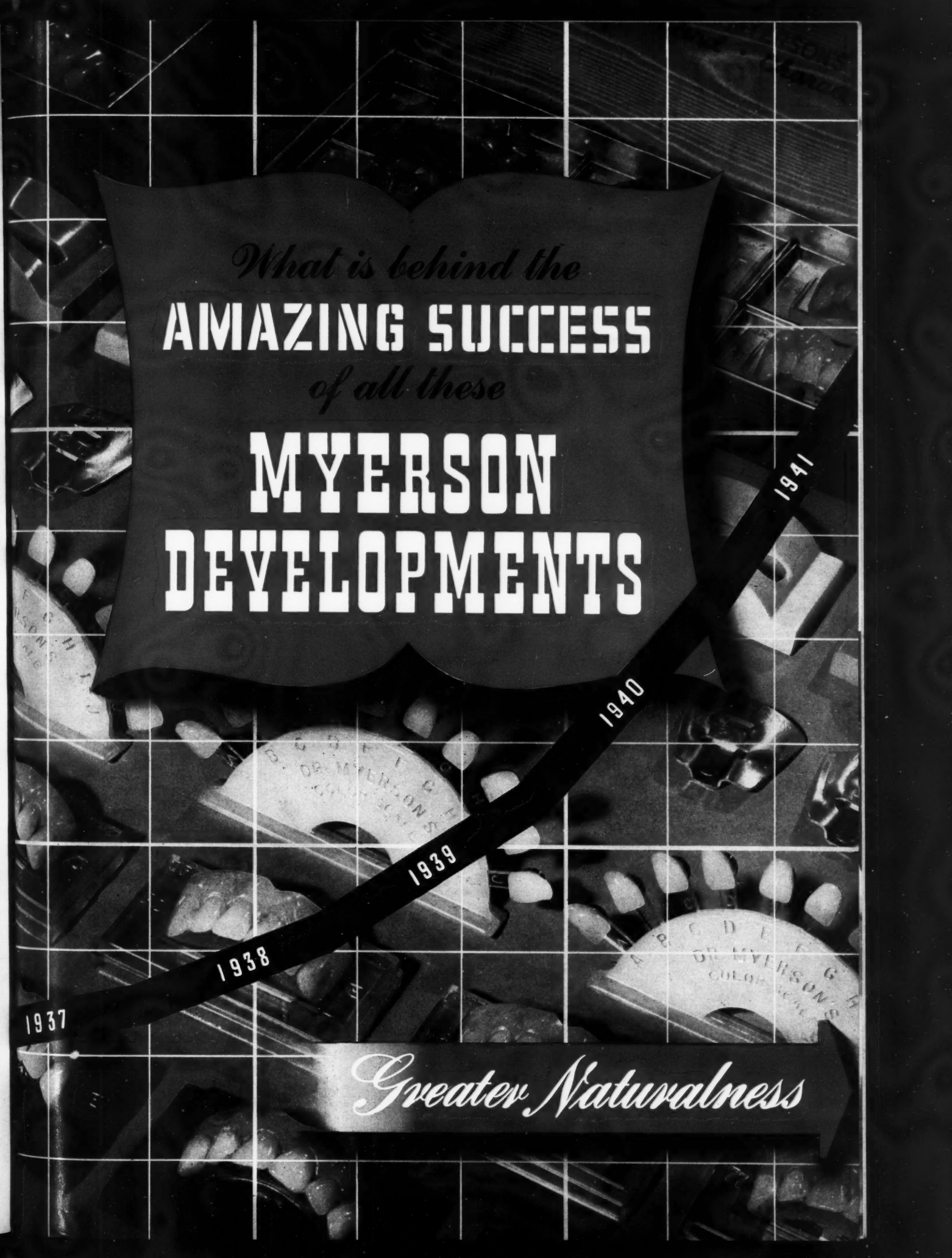
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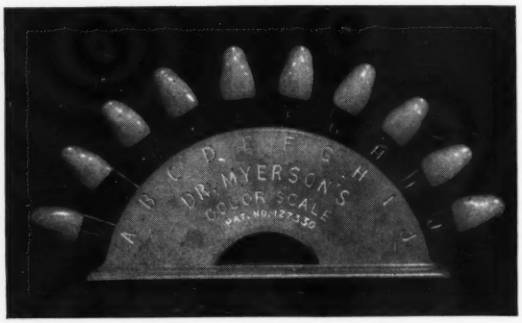

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DENTAL MEETING

Dates

Southern Society of Orthodontists, regular meeting, Raleigh, North Carolina, September 29-30.

•

Montreal Dental Club, seventeenth annual fall clinic, Mount Royal Hotel, Montreal, September 24-26.

•

Brooklyn Dental Health Day, Hotel Bossert, September 29. The program will run from one to eleven o'clock, with an afternoon session devoted to the children, their mothers, and school teachers. The evening session will be for adults. Conducted by the Second District Dental Society, a component of the American Dental Association.

•

American Academy for Plastics Research in Dentistry, the newly organized society for the purpose of coordinating the activities involved in the use of organic plastics in the dental profession, Assembly Room of the Houston Chamber of Commerce, Houston, October 26, at 2 o'clock. Application for admission may be made through the office of the secretary, LaMar W. Harris, 25 East Washington Street, Chicago.

•

American Public Health Association, regular meeting, Atlantic City, New Jersey, October 14-17.

•

University of Buffalo Dental Alumni Association, forty-first annual meeting, Hotel Statler, October 14-16.

•

American Academy of Periodontology, regular meeting, Houston, October 23-25.

•

American Society for the Advancement of General Anesthesia in Dentistry, Fall meeting, Midston House, 38th Street and Madison Avenue, New York City, October 27.

•

American Dental Association, annual meeting, Rice Hotel, Houston, October 27-31.

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A MODERN WEAPON AGAINST ORAL SEPSIS

THE ORAL SURGEON faces a unique problem; he must carry out surgical procedures, the success of which depends not only upon his skill, but also upon the absence of infection in one of the most highly infected cavities of the body—the mouth. In this he is aided by the defense mechanism and immunity of the patient's own tissues, but when these are traumatized, as occurs with even the most careful surgery, the tissue defense against infection is impaired. An antiseptic agent must be used, therefore, which not only kills bacteria, but which is not toxic to tissue and does not interfere with the natural defense mechanisms.

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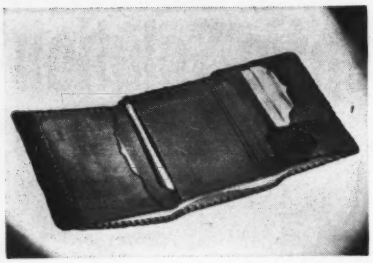

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*What Patients Think About Dentistry—Oral Hygiene, March, 1941.

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American Dental Assistants' Association, seventeenth annual meeting, Texas State Hotel, Houston, October 27-31.

•

American Dental Hygienists' Association, eighteenth annual meeting, Lamar Hotel, Houston, October 27-31.

•

American Association of Public Health Dentists, regular meeting, Houston, October 27-31.

•

Ohio State Dental Society, seventy-sixth annual meeting, Neil House Hotel, Columbus, November 10-12.

•

Odontological Society of Western Pennsylvania, annual meeting, William Penn Hotel, Pittsburgh, November 11-13.

•

American Association for the Advancement of Oral Diagnosis, eighth annual meeting, New York Academy of Medicine, New York City, November 13-14.

•

Midcontinent Dental Congress, St. Louis, November 17-19.

•

New Jersey State Board of Dental Examiners, regular meeting, December 8-12. For information write to Doctor Walter A .Wilson, 150 East State Street, Trenton.

•

California State Board of Dental Examiners, regular meeting, December 15, Physicians and Surgeons College of Dentistry, San Francisco. For information write to Doctor K. I. Nesbitt, 515 Van Ness Avenue, San Francisco.

•

Ohio State Board of Dental Examiners, October meeting, the week beginning October 20, at the Ohio State University, College of Dentistry, Columbus. For information write to Doctor Earl D. Lowry, 79 East State Street, Columbus.

•

Connecticut Dental Commission, regular meeting, November 25-29, Hartford. Applications must be in the hands of the Recorder at least ten days prior to date of meeting. For information write to Doctor Clarence G. Brooks, New London.

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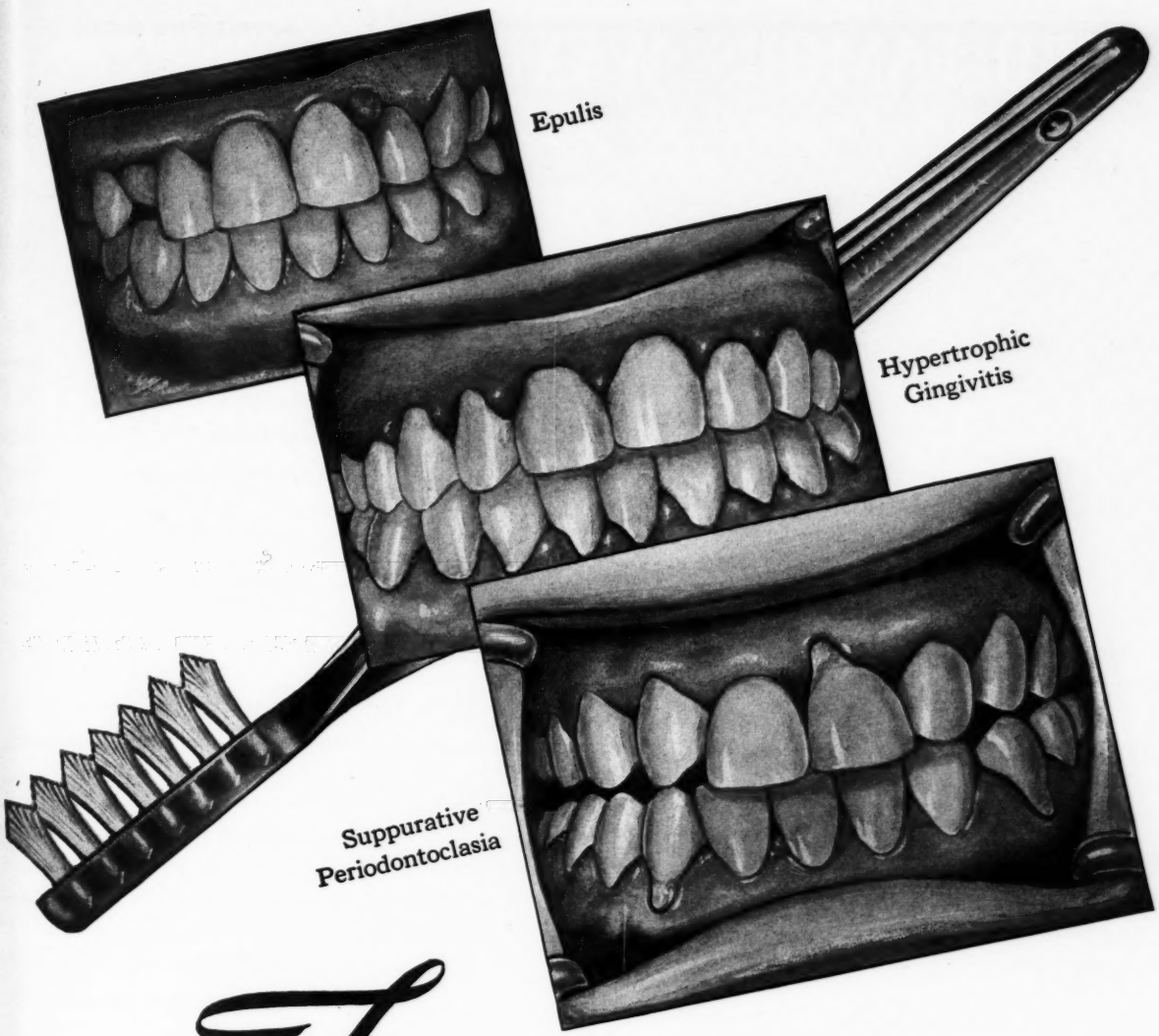

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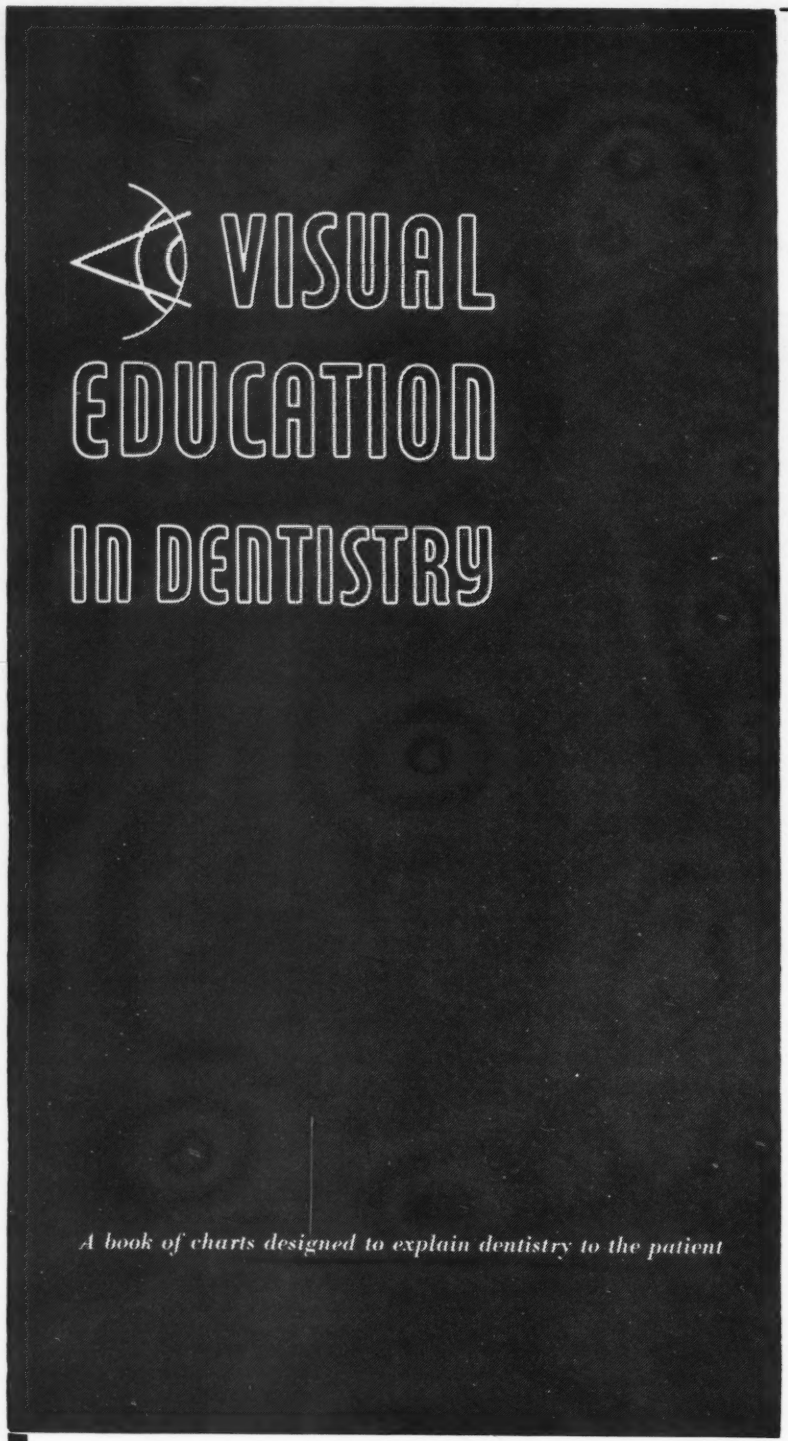

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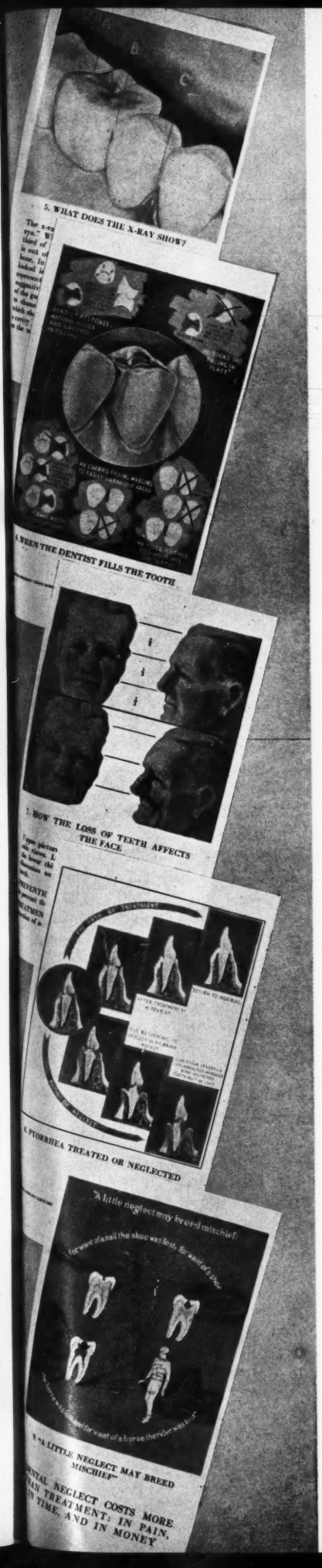
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3. HOW THE LOSS OF TEETH AFFECTS THE FACE
2. PYORRHEA TREATED OR NEGLECTED
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for want of a horse the rider was lost
1. "A LITTLE NEGLECT MAY BREED MISCHIEF"
DENTAL NEGLECT COSTS MORE THAN TREATMENT: IN PAIN, IN TIME, AND IN MONEY

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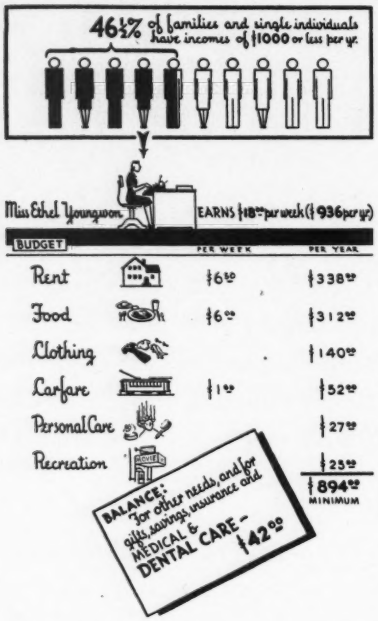
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Don't miss the rousing leading article in September ORAL HYGIENE under this title. Doctor S. J. Bregstein wrote it. "Have the best procedures in dentistry been invented only for the wealthy?" he wants to know. "What about Mr. and Mrs. Averageman and their children?" The chart above (from the article) tells why so few can afford the complicated and costly techniques being developed nowadays.

Doctor Frank B. Bostwick is back home after nearly 40 years in Gibraltar; Doctor Francis L. Golden interviewed him for ORAL HYGIENE . . . "Dentistry Needs a Subsidy," according to Doctor Stanley C. Brown who advocates government loans to young people desiring to study dentistry . . . "Speaking as a Patient" briefs the observations of a psychiatrist under dental treatment . . . With Iceland in the news, ORAL HYGIENE questioned a native, Doctor Olaf J. Olfafsson, with interesting results . . . Doctor R. Reed Smith says, "We Need Help to Tell our Story," to the public . . . A 2-page table supports the contention that dental delegates "come and go and some stay too long," and the editorial asks "Who Picks *Your* Delegates? . . . Then there's Military and Defense News, the letter department, Dentists in the News, Ask ORAL HYGIENE, Technique of the Month, and Laffodontia. In the Corner, that controversy continues to rage.

In your September

Oral Hygiene

NOTES ON THE *Cuff*

The Wailing Wall of Journalism . .

Every editor's desk is a Wailing Wall. To it come the people with honest complaints and vital points of view but there are also schizophrenic wailers, the sufferers from persecution complexes and the garden variety of bellyachers. Today's mail brings a letter from a dentist who says he has degrees from two class A dental schools and rejection slips from four state dental board examinations. He places the blame not on himself but upon the schools and the system. If it is true that he passed through two dental schools (and it is hard for me to understand why anyone finds it necessary to graduate from two schools) and failed before four different state boards, it is certainly time for us to examine the whole picture of dental education.

We all know young men who are carried along for two or three years and some for even the full term before they are told or find out for themselves that they have no aptitudes for dentistry. We hear so much about aptitude tests and intelligence tests and vocational guidance that one wonders what methods might be used to seek out the skills of those who wish to prepare for a life in dentistry. It does seem that this man with two dental degrees who cannot pass a state board should have been told somewhere along the line that he had no place in dentistry. It is a suspicious suggestion to make but perhaps the tuition fees are an item in holding people too long in false encouragement in the dental colleges. That possibility cannot be overlooked.

What attributes should a young man have who wishes to follow a career in dentistry? I suppose he must have an interest in the intimacies and perplexities of people inasmuch as he is to deal with the human personality under some of its most trying conditions. He must be enough of an extrovert to like peo-

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ple, because he is going to see enough of them at close range and with souls bared. He cannot, moreover, be too squeamish; he must, without revulsion, be able to dip into the human-ness of saliva and with nonchalance, manipulate the gory and without noticing, see people in various stages of oral deshabille. He should have physical stamina of a high order: weak legs and sagging backs and bad eyes and unstable nerves are not conditions that make for success in a dentist. And with these prerequisites he must have unquestionable manual skill. A person who has no concept of mechanical and engineering principles nor the ability to exercise them has no right to enter the practice of dentistry. Finally, a modern dentist must be more than a skilled artisan; he must be well grounded in biologic fundamentals and must be one who thinks in terms of biologic entities.

There are doubtless many other aptitudes necessary which I, a rank amateur in psychologic determinants, know nothing about; but the psychologists and the vocational guidance people who are supposed to know these things should be able to set up a group of tests and standards to be applied to such persons as the Two-Dental-Degree-Four-State-Board-Rejectee who this day wrote to my Wailing Wall.

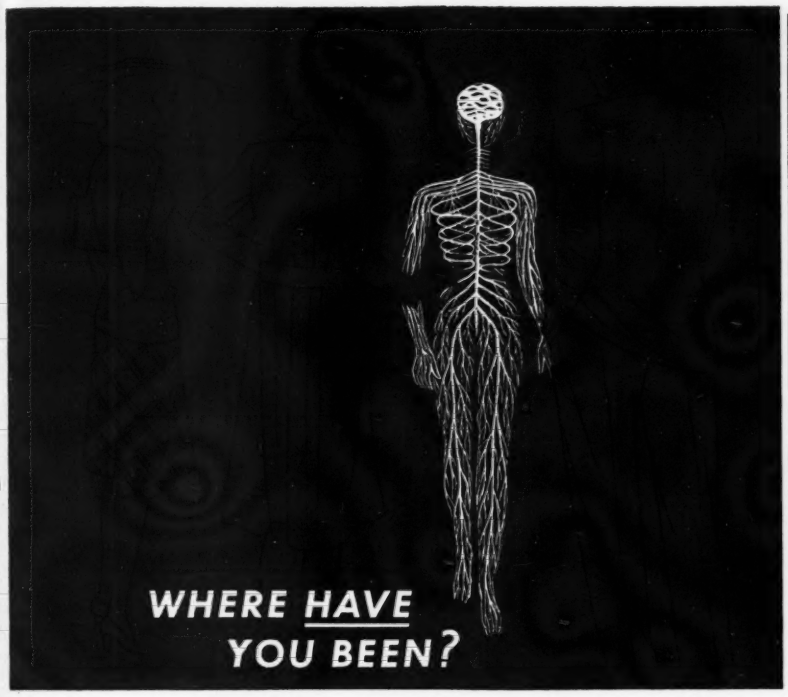
When is a Patient Not a Patient? . . .

If a patient of "yours" who has been under your care for four or five years received a letter from another dentist, such as I am about to quote, what would your reaction be? Would you call the dentist up and tell him what a chiseling louse he is? Would you resign from the dental society merely because this fellow is a member? Would you get up in open meeting and give him hell? Would you cite him to appear before the Board of Censors for violation of something or other? Or, would you restrain your resentment and silence your scoffing? Here is the letter:

"Dear Mrs. . . . :

"According to Doctor . . . 's record it has been nine (9) years since you have been in for a dental examination. In order to keep your teeth and gums in good condition and probab-

(*Continued on page* 428)



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ly care for the work that has already been done, I would suggest that you make an appointment for a re-examination and prophylaxis."

When a patient has been away for nine years any dentist should understand that he is a lost soul so far as his practice is concerned. People do leave us. Let us keep that in mind. If dental practices were not fluid and if people stayed with us forever, it would be mighty hard for any man to get started in practice. If we went back over our records and sent notices to every name that appeared there, we could be pretty sure that we were soliciting the patronage of patients who are currently being served by other dentists.

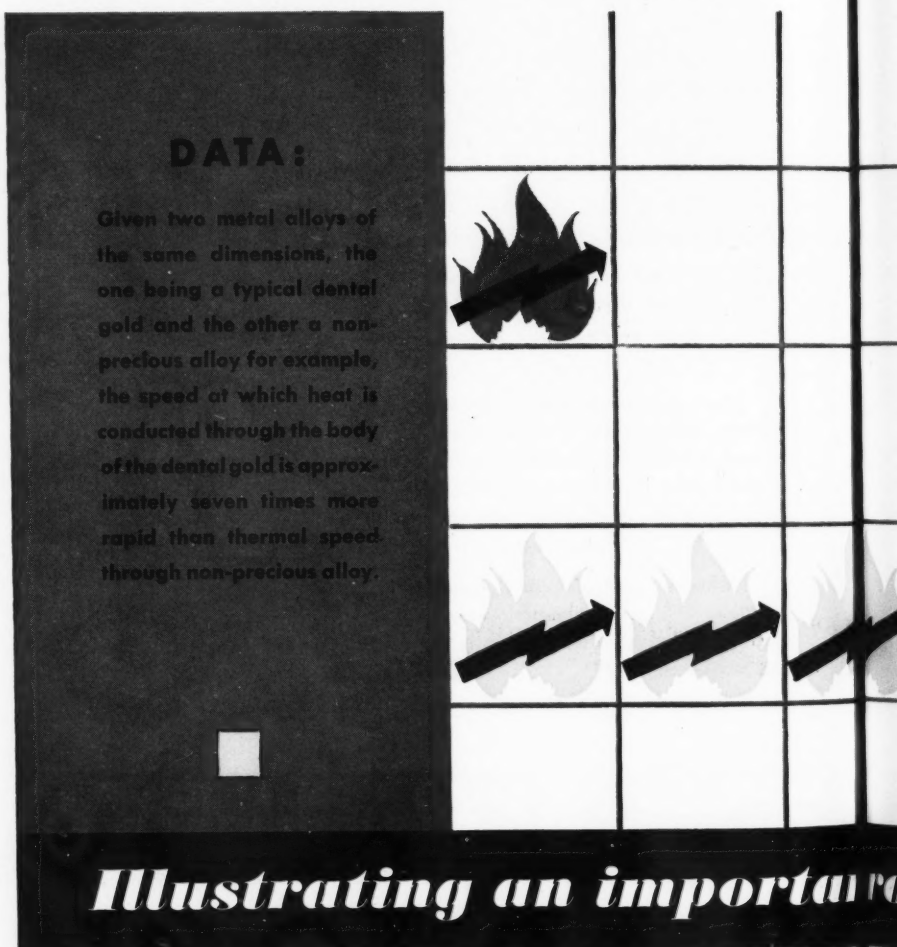
This all brings up the point of how far back we can go in our records in sending our recall letters. What people we may consider it proper to solicit without treading on the sensitivity of colleagues? Even in the matter of periodic recalls, how can we tell which patients should be recalled for appointment? I do not believe that anyone should ever be recalled for an appointment unless the patient himself has expressed a definite wish to be so notified. Should the patient fail to respond to the recall that he himself requested, it is well to note that fact on the record card. Another notice might be permissible, but to continue to send out letters and solicitations to people who have failed to respond is not only being obtuse but is running the risk of offending them as well as the dentists who are probably now serving them.

Every time I look through my own records and see the names of persons who have by their own volition dropped from my lists and have not appeared for years, I suffer from hot flashes and guilt feelings. I am pretty sure that most of them, unless they have died or moved away, failed to return because of my inadequacies. For the most part, probably the dentistry that I did for them was reasonably satisfactory, but they stayed away, I fear, because of little annoyances that I or someone in the office inflicted. Maybe they did not like the chairs or the magazines in the reception room or the color of the assistant's hair or the way my spectacles perched upon my nose. Maybe I did not make plain to them in advance of treatment what I was going to do or what their obligations were, with the result that upon conclusion of the treatment the bill came as a surprise and shock to them.

I wish I had the courage to put on a pair of false whiskers, a long black cloak and steal out like "The Shadow" to interview these people who were once on the "active patient" list but haven't been in attendance for years. I am sure that my face, behind the mask, would be mighty red. From such an exploration I am also sure that I would learn a great deal which would help me in the future conduct of practice. Even now, however, I know I will not send notices to these people nine years after their absence from my chair! I can take the hints after an interval of such length that other dentists have taken my place and that I represent something in their lives that they would just as soon forget.

Claimants to Fame . . .

It is likely that when Pasteur and Jenner and Lister first announced their discoveries, somebody in the back of the audience rose and said, "That idea is not new. I had it twenty years ago." I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Given two metal alloys of the same dimensions, the one being a typical dental gold and the other a non-precious alloy for example, the speed at which heat is conducted through the body of the dental gold is approximately seven times more rapid than thermal speed through non-precious alloy.
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GOL
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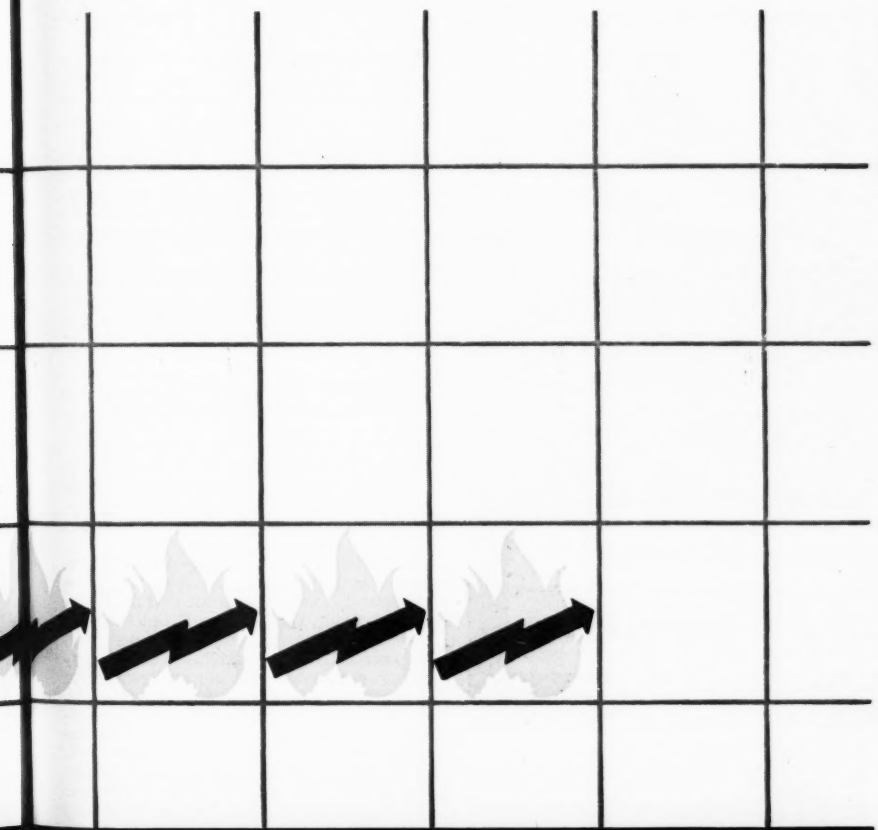
have never known a single new technique or subject to be mentioned in dental literature to which somebody didn't claim priority. When workers make the effort and take the trouble to publish their material and stand ready to assume the responsibilities of publication, it is preposterous for these indignant priority claimants to set up their howls of plagiarism. If they knew something the rest of us didn't, why didn't they take the trouble to publish or announce it? Anyone who has something new and worthwhile and holds it to himself can hardly claim recognition. As soon as it is reasonably well tested, he should put it in print, thus contributing to the profession and establishing his priority. It is a professional responsibility to pass along to our colleagues whatever little knowledge we acquire in our lifetime. When points of controversy arise and tenets must be debated, if truths are ever to be established and recognition placed without grudge where it is due, we must remember to be objective and magnanimous and patient. Sir Thomas Brown said it better than anyone:

"I make not therefore my head a grave, but a treasure of knowledge; I intend no monopoly, but a community of learning; I study not for my own sake, but for theirs that study not for themselves. I instruct no man as an exercise of my knowledge, but with an intent rather to nourish and keep it alive in mine own head than to beget and propagate it in his. I cannot fall out or condemn a man for an error, or conceive why a difference of opinion should divide an affection; for controversies, disputes and argumentations, if they be met with discreet and peaceable natures, do not infringe the laws of charity; in all disputes, so much as there is of passion, so much there is of nothing to the purpose, for then reason, like a bad hound, spends upon a false scent, and forsakes the question first started. And this is why controversies are never determined, for though they may be amply handled, they do so swell with unnecessary digressions; and the parenthesis of party is often as large as the main discourse upon the subject."—E. J. R.

Dental College Merges with University

Through an important merger agreed upon by the officials of the two institutions, Kansas City-Western Dental College has become the School of Dentistry of the University of Kansas City. Doctor Roy J. Rinehart, who as dean and administrator of the dental college for the past twenty years, has been the principal factor in establishing the high scholastic standards for which it is widely known, has been appointed dean of the school of dentistry. Dental courses will continue to be taught in the 3-story school building at Tenth street and Troost avenue, Kansas City. The fifty-two faculty members, dentists and physicians, will become a part of the university's dentistry school faculty. The Kansas City-Western Dental College has Class A rating and, in announcing the merger on the sixtieth anniversary of the dental school, Doctor Rinehart pointed out that it was effected solely from an educational point of view, as the institution has been maintained on a financially sound basis and has no obligations. Dental students may now enter the University of Kansas City as freshmen for the full six years.



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